



# **Discrete Products**

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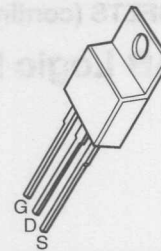
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# Power MOSFETS

## TO-220AB DMOS



DMOS MOSFETS

### N Channel

(Volts) Min	Device	$r_{DS(on)} @ I_D/V_{GS}$		$I_D$ (Amps) Max	$P_D$ (Watts) Max
		(mΩ) Max	(Amps/Volts)		
100	NDP710A	38	21/10	42	150
	NDP710AE				
	NDP710B	42	21/10	40	
	NDP710BE				
	NDP610A	65	13/10	26	100
	NDP610AE				
	NDP610B	80	12/10	24	
	NDP610BE				
	NDP510A	120	7.5/10	15	60
	NDP510AE				
	NDP510B	150	6.5/10	13	
	NDP510BE				
	NDP410A	250	4/10	8	40
	NDP410AE				
80	NDP410B	300	3.5/10	7	
	NDP410BE				
	NDP708A	22	31/10	60	150
	NDP708AE				
	NDP708B	25	27/10	52	
	NDP708BE				
	NDP608A	42	18/10	36	100
	NDP608AE				
	NDP608B	45	16/10	32	
	NDP608BE				
	NDP508A	80	9.5/10	19	60
	NDP508AE				
	NDP508B	100	8.5/10	17	
	NDP508BE				
	NDP408A	160	5.5/10	11	40
	NDP408AE				
	NDP408B	200	5/10	10	
	NDP408BE				

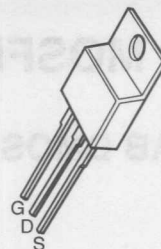
### N Channel

(Volts) Min	Device	$r_{DS(on)} @ I_D/V_{GS}$		$I_D$ (Amps) Max	$P_D$ (Watts) Max
		(mΩ) Max	(Amps/Volts)		
60	NDP706A	15	40/10	75	150
	NDP706AE				
	NDP706B	18	35/10	70	
	NDP706BE				
	NDP606A	25	24/10	48	100
	NDP606AE				
	NDP606B	28	21/10	42	
	NDP606BE				
	NDP506A	50	13/10	26	60
	NDP506AE				
	NDP506B	60	12/10	24	
	NDP506BE				
	NDP406A	100	7.5/10	15	40
	NDP406AE				
50	NDP406B	150	6/10	12	
	NDP406BE				
	MTP3055E				
	NDP705A	15	40/10	75	150
	NDP705AE				
	NDP705B	18	35/10	70	
	NDP705BE				
	NDP605A	25	24/10	48	100
	NDP605AE				
	NDP605B	28	21/10	42	
	NDP605BE				
	NDP505A	50	13/10	26	60
	NDP505AE				
	NDP505B	60	12/10	24	
	NDP505BE				
	NDP405A	100	7.5/10	15	40
	NDP405AE				
	NDP405B	150	6/10	12	
	NDP405BE				

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## TO-220AB Logic Level DMOS



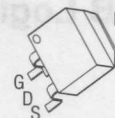
## N Channel

(Volts) Min	Device	$r_{DS(on)} @ I_D/V_{GS}$		$I_D$ (Amps) Max	$P_D$ (Watts) Max
		(m $\Omega$ ) Max	(Amps/Volts)		
100	NDP710AEL	38	21/5	42	150
	NDP710AL				
	NDP710BEL	42	21/5	40	
	NDP710BL				
	NDP610AEL	65	13/5	26	100
	NDP610AL				
	NDP610BEL	80	12/5	24	
	NDP610BL				
	NDP510AEL	120	7.5/5	15	60
	NDP510AL				
	NDP510BEL	150	6.5/5	13	
	NDP510BL				
	NDP410AEL	250	4/5	8	40
	NDP410AL				
	NDP410BEL	300	3.5/5	7	
	NDP410BL				
80	NDP708AEL	22	19/5	60	150
	NDP708AL				
	NDP708BEL	25	18/5	52	
	NDP708BL				
	NDP608AEL	42	18/5	36	100
	NDP608AL				
	NDP608BEL	45	16/5	32	
	NDP608BL				
	NDP508AEL	80	9.5/5	19	60
	NDP508AL				
	NDP508BEL	100	8.5/5	17	
	NDP508BL				
	NDP408AEL	160	5.5/5	11	40
	NDP408AL				
	NDP408BEL	200	5/5	10	
	NDP408BL				

## N Channel

(Volts) Min	Device	$r_{DS(on)} @ I_D/V_{GS}$		$I_D$ (Amps) Max	$P_D$ (Watts) Max
		(m $\Omega$ ) Max	(Amps/Volts)		
60	NDP706AEL	15	40/5	75	150
	NDP706AL				
	NDP706BEL	18	35/5	70	
	NDP706BL				
	NDP606AEL	25	24/5	48	100
	NDP606AL				
	NDP606BEL	28	21/5	42	
	NDP606BL				
	NDP506AEL	50	13/5	26	60
	NDP506AL				
	NDP506BEL	60	12/5	24	
	NDP506BL				
	NDP406AEL	100	7.5/5	15	40
	NDP406AL				
	NDP406BEL	150	6/5	12	
	NDP406BL				
MTP3055EL	180	6/5	12		
50	NDP705AEL	15	40/5	75	150
	NDP705AL				
	NDP705BEL	18	35/5	70	
	NDP705BL				
	NDP605AEL	25	24/5	48	100
	NDP605AL				
	NDP605BEL	28	21/5	42	
	NDP605BL				
	NDP505AEL	50	13/5	26	60
	NDP505AL				
	NDP505BEL	60	12/5	24	
	NDP505BL				
	NDP405AEL	100	7.5/5	15	40
	NDP405AL				
	NDP405BEL	150	6/5	12	
	NDP405BL				

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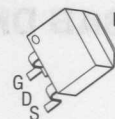
## N Channel

(Volts) Min	Device	$r_{DS(on)}$ @ $I_D/V_{GS}$		$I_D$ (Amps) Max	$P_D$ (Watts) Max
		(m $\Omega$ ) Max	(Amps/Volts)		
100	NDB710A	38	21/10	42	150
	NDB710AE				
	NDB710B	42	21/10	40	
	NDB710BE				
	NDB610A	65	13/10	26	100
	NDB610AE				
	NDB610B	80	12/10	24	
	NDB610BE				
	NDB510A	120	7.5/10	15	60
	NDB510AE				
	NDB510B	150	6.5/10	13	
	NDB510BE				
	NDB410A	250	4/10	8	40
	NDB410AE				
	NDB410B	300	3.5/10	7	
	NDB410BE				
80	NDB708A	22	31/10	60	150
	NDB708AE				
	NDB708B	25	27/10	52	
	NDB708BE				
	NDB608A	42	18/10	36	100
	NDB608AE				
	NDB608B	45	16/10	32	
	NDB608BE				
	NDB508A	80	9.5/10	19	60
	NDB508AE				
	NDB508B	100	8.5/10	17	
	NDB508BE				
	NDB408A	160	5.5/10	11	40
	NDB408AE				
	NDB408B	200	5/10	10	
	NDB408BE				

## N Channel

(Volts) Min	Device	$r_{DS(on)} @ I_D/V_{GS}$		$I_D$ (Amps) Max	$P_D$ (Watts) Max
		(m $\Omega$ ) Max	(Amps/Volts)		
60	NDB706A	15	40/10	75	150
	NDB706AE				
	NDB706B	18	35/10	70	
	NDB706BE				
	NDB606A	25	24/10	48	100
	NDB606AE				
	NDB606B	28	21/10	42	
	NDB606BE				
	NDB506A	50	13/10	26	60
	NDB506AE				
	NDB506B	60	12/10	24	
	NDB506BE				
	NDB406A	100	7.5/10	15	40
	NDB406AE				
	NDB406B	150	6/10	12	
	NDB406BE				
50	NDB705A	15	40/10	75	150
	NDB705AE				
	NDB705B	18	35/10	70	
	NDB705BE				
	NDB605A	25	24/10	48	100
	NDB605AE				
	NDB605B	28	21/10	42	
	NDB605BE				
	NDB505A	50	13/10	26	60
	NDB505AE				
	NDB505B	60	12/10	24	
	NDB505BE				
	NDB405A	100	7.5/10	15	40
	NDB405AE				
	NDB405B	150	6/10	12	
	NDB405BE				

## TO-263AB Logic Level DMOS



## N Channel

(Volts) Min	Device	$r_{DS(on)}$ @ $I_D/V_{GS}$		$I_D$ (Amps) Max	$P_D$ (Watts) Max
		(m $\Omega$ ) Max	(Amps/Volts)		
100	NDB710AEL	38	21/5	42	150
	NDB710AL				
	NDB710BEL	42	21/5	40	
	NDB710BL				
	NDB610AEL	65	13/5	26	100
	NDB610AL				
	NDB610BEL	80	12/5	24	
	NDB610BL				
	NDB510AEL	120	7.5/5	15	60
	NDB510AL				
	NDB510BEL	150	6.5/5	13	
	NDB510BL				
	NDB410AEL	250	4/5	8	40
	NDB410AL				
	NDB410BEL	300	3.5/5	7	
	NDB410BL				
80	NDB708AEL	22	19/5	60	150
	NDB708AL				
	NDB708BEL	25	18/5	52	
	NDB708BL				
	NDB608AEL	42	18/5	36	100
	NDB608AL				
	NDB608BEL	45	16/5	32	
	NDB608BL				
	NDB508AEL	80	9.5/5	19	60
	NDB508AL				
	NDB508BEL	100	8.5/5	17	
	NDB508BL				
	NDB408AEL	160	5.5/5	11	40
	NDB408AL				
	NDB408BEL	200	5/5	10	
	NDB408BL				

## N Channel

(Volts) Min	Device	$r_{DS(on)}$ @ $I_D/V_{GS}$		$I_D$ (Amps) Max	$P_D$ (Watts) Max
		(m $\Omega$ ) Max	(Amps/Volts)		
60	NDB706AEL	15	40/5	75	150
	NDB706AL				
	NDB706BEL	18	35/5	70	
	NDB706BL				
	NDB606AEL	25	24/5	48	100
	NDB606AL				
	NDB606BEL	28	21/5	42	
	NDB606BL				
	NDB506AEL	50	13/5	26	60
	NDB506AL				
	NDB506BEL	60	12/5	24	
	NDB506BL				
	NDB406AEL	100	7.5/5	15	40
	NDB406AL				
	NDB406BEL	150	6/5	12	
	NDB406BL				
50	NDB705AEL	15	40/5	75	150
	NDB705AL				
	NDB705BEL	18	35/5	70	
	NDB705BL				
	NDB605AEL	25	24/5	48	100
	NDB605AL				
	NDB605BEL	28	21/5	42	
	NDB605BL				
	NDB505AEL	50	13/5	26	60
	NDB505AL				
	NDB505BEL	60	12/5	24	
	NDB505BL				
	NDB405AEL	100	7.5/5	15	40
	NDB405AL				
	NDB405BEL	150	6/5	12	
	NDB405BL				

## TO-252 (D-PAK) DMOS

## N Channel

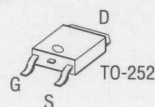
(Volts) Min	Device	$r_{DS(on)}$ @ $I_D/V_{GS}$		$I_D$ (Amps) Max	$P_D$ (Watts) Max
		(m $\Omega$ ) Max	(Amps/ Volts)		
60	NDD506A	50	9.5/10	19	72
	NDD506AE				
	NDD506B	60	9.0/10	18	72
	NDD506BE				
	NDD406A	100	7.5/10	15	40
	NDD406AE				
	NDD406B	150	6.0/10	12	40
	NDD406BE				
	MTD3055E	150	4.0/10	8	20

## TO-252 Logic Level DMOS

## N Channel

(Volts) Min	Device	$r_{DS(on)}$ @ $I_D/V_{GS}$		$I_D$ (Amps) Max	$P_D$ (Watts) Max
		(m $\Omega$ ) Max	(Amps/ Volts)		
60	NDD506AL	50	9.5/5	19	72
	NDD506AEL				
	NDD506BL	60	9.0/5	18	72
	NDD506BEL				
	NDD406AL	100	7.5/5	15	40
	NDD406AEL				
	NDD406BL	150	6.0/5	12	40
	NDD406BEL				
	MTD3055EL	180	6.0/5	12	40

Note: Suffix E indicates the device is avalanche energy rated.



## TO-251 (I-PAK) DMOS

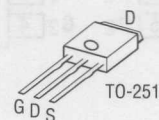
## N Channel

(Volts) Min	Device	$r_{DS(on)}$ @ $I_D/V_{GS}$		$I_D$ (Amps) Max	$P_D$ (Watts) Max
		(m $\Omega$ ) Max	(Amps/ Volts)		
60	NDU506A	50	9.5/10	19	72
	NDU506AE				
	NDU506B	60	9.0/10	18	72
	NDU506BE				
	NDU406A	100	7.5/10	15	40
	NDU406AE				
	NDU406B	150	6.0/10	12	40
	NDU406BE				
	MTD3055E1	150	4.0/10	8	20

## TO-251 Logic Level DMOS

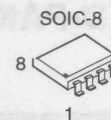
## N Channel

(Volts) Min	Device	$r_{DS(on)}$ @ $I_D/V_{GS}$		$I_D$ (Amps) Max	$P_D$ (Watts) Max
		(m $\Omega$ ) Max	(Amps/ Volts)		
60	NDU506AL	50	9.5/5	19	72
	NDU506AEL				
	NDU506BL	60	9.0/5	18	72
	NDU506BEL				
	NDU406AL	100	7.5/5	15	40
	NDU406AEL				
	NDU406BL	150	6.0/5	12	40
	NDU406BEL				
	MTD3055EL1	180	6.0/5	12	40





## SOIC-8 Dual/Single DMOS



## N Channel

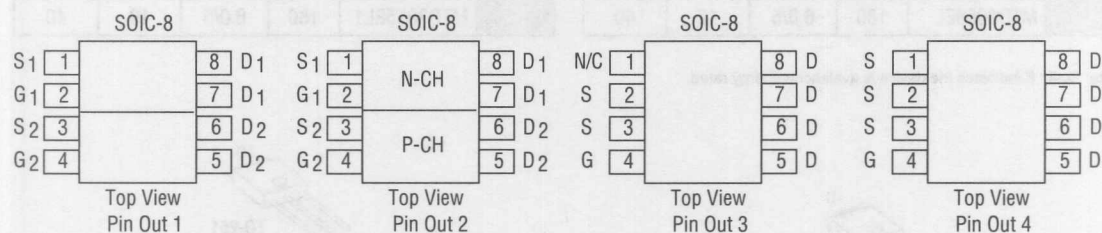
(Volts) Min	Device	$r_{DS(on)}$		$I_D$ (A) Max	$P_D$ (Watts) Max	Configuration	Pin Out
		$V_{GS} = 10V$	$V_{GS} = 4.5V$				
30	NDS9410*	0.03	0.05	7	2	Single	3
60	NDS9945	0.1	0.2	3.5	2	Dual	1
50	NDS9955	0.13	0.2	3	2	Dual	1
20	NDS9956	0.1	0.2	3.5	2	Dual	1

\* Advance Information.

## P Channel

(Volts) Min	Device	$r_{DS(on)}$		$I_D$ (A) Max	$P_D$ (Watts) Max	Configuration	Pin Out
		$V_{GS} = 10V$	$V_{GS} = 4.5V$				
-20	NDS9400*	0.25	0.4	-2.5	2	Single	3
-20	NDS9405*	0.1	0.16	-4.3	2	Single	3
-60	NDS9407*	0.15	0.24	-3.3	2	Single	4
-20	NDS9430*	0.06	0.1	-5.3	2	Single	4
-30	NDS9435*	0.07	0.1	-5.3	2	Single	4
-20	NDS9947*	0.11	0.19	-3.5	2	Dual	1
-60	NDS9948*	0.25	0.5	-2.3	2	Dual	1
-20	NDS9953	0.25	0.4	-2.3	2	Dual	1

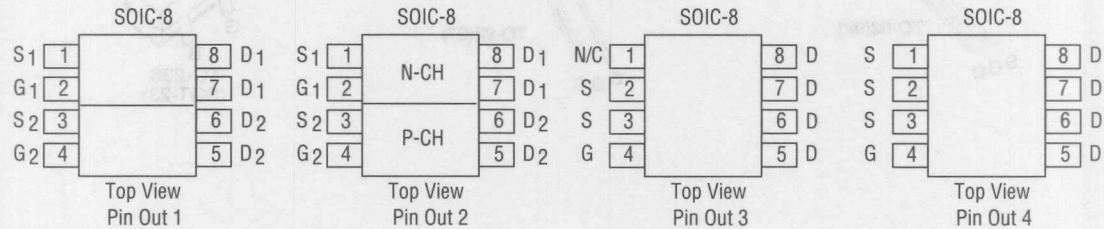
\* Advance Information.



Complementary N-P Channel

(Volts) Min	Device	$r_{DS(on)}$		$I_D$ (A) Max	$P_D$ (Watts) Max	Configuration	Pin Out
		$V_{GS} = 10V$	$V_{GS} = 4.5V$				
20	NDS9942	0.125	0.25	3	2	N Channel	2
-20		0.2	0.35	-2.5		P Channel	
20	NDS9943*	0.125	0.25	3	2	N Channel	2
-20		0.16	0.3	-2.8		P Channel	
25	NDS9952	0.1	0.15	3	2	N Channel	2
-25		0.25	0.4	-2.3		P Channel	
20	NDS9958*	0.1	0.15	3.5	2	N Channel	2
-20		0.11	0.19	-3		P Channel	

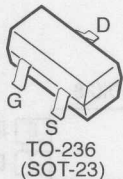
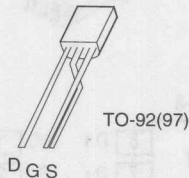
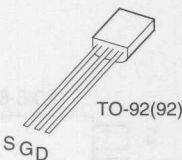
\* Advance Information.



# Signal MOSFETS N-Channel (TO-92, TO-236)

$V_{(BR)DSS}$ (Volts) Min	Device	$r_{DS(on)}$ @ $I_D/V_{GS}$		$I_D$ (Amps) Max	Package	$P_D$ (mW) Max
		( $\Omega$ ) Max	(Amps/Volts)			
60	BS270	2.0	0.5/10	0.4	TO-92(97)	625
	NDF7000A	2.0	0.5/10	0.4	TO-92(92)	625
	NDS7002A	2.0	0.5/10	0.28	TO-236*	300
	2N7000	5.0	0.5/10	0.2	TO-92(92)	400
	BS170	5.0	0.2/10	0.5	TO-92(97)	830
	MMBF170	5.0	0.2/10	0.5	TO-236*	300
	2N7002	7.5	0.5/10	0.115	TO-236*	200
* TO-236AB is standard for all devices. Please refer to Surface Mount section for TO-236 Device Marking.						

2





# Junction FETS

JFET General Purpose .....	3-1
JFET RF, VHF, UHF Amplifiers .....	3-3
JFET Low Frequency/Low Noise Amplifiers .....	3-4
JFET Switches/Choppers .....	3-5
JFET Ultra Low Input Current Amplifiers .....	3-8
Dual JFETs .....	3-9



# JFET General Purpose

## P Channel

Device	BV <sub>GSS</sub> (V) Min	V <sub>P</sub> @ V <sub>DS</sub> I <sub>D</sub>				G <sub>IS</sub> (mmho)		C <sub>iss</sub> (pF) Max	C <sub>rss</sub> (pF) Max	en @ Freq		Package
		(V)		(V)	(nA)					Max	(Hz)	
		Min	Max									
2N3820	20		8	−10	10000	0.8	5	32	16			TO-92(94)
PN5033	20	0.3	2.5	−10	1000	1	5	25	7	100	100	TO-92(92)
2N5460	40	0.75	6	−15	1000	1	4	7	2	115	100	TO-92(92)
MMBF5460	40	0.75	6	−15	1000	1	4	7	2	115	100	TO-236*
2N5461	40	1	7.5	−15	1000	1.5	5	7	2	115	100	TO-92(92)
MMBF5461	40	1	7.5	−15	1000	1.5	5	7	2	115	100	TO-236*
2N5462	40	1.8	9	−15	1000	2	6	7	2	115	100	TO-92(92)
MMBF5462	40	1.8	9	−15	1000	2	6	7	2	115	100	TO-236*
MMBFJ270	30	0.5	2	−15	1	6	15	t20	t5	t10	1000	TO-236*
J270	30	0.5	2	−15	1	6	15	t20	t5	t10	1000	TO-92(94)
MMBFJ271	30	1.5	4.5	−15	1	8	18	t20	t5	t10	1000	TO-236*
J271	30	1.5	4.5	−15	1	8	18	t20	t5	t10	1000	TO-92(94)

\* TO-236AB is standard for all devices.

Please refer to Surface Mount section for TO-236 Device Marking.

t = typical value



TO-92(92)



TO-18(11)



TO-92(94)



TO-236  
(SOT-23)

# JFET General Purpose (continued)

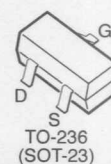
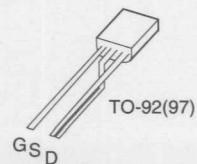
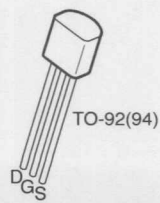
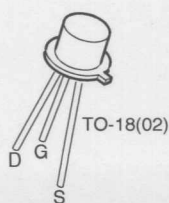
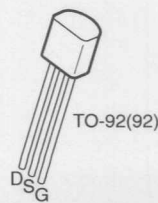
## N Channel

Device	BV <sub>GSS</sub> (V) Min	V <sub>P</sub> @ V <sub>DS</sub> I <sub>D</sub>				G <sub>fs</sub> (mmho)		Ciss (pF) Max	Crss (pF) Max	en @ Freq		Package
		(V)		(V)	(nA)					Max	(Hz)	
		Min	Max			Min	Max					
2N3684	50	2	5	20	1	2	3	4	1.2	150	20	TO-72
2N3686	50	0.6	2	20	1	1	2	4	1.2	150	20	TO-72
2N3822	50		6	15	0.5	3	6.5	6	3	200	10	TO-72
PN4303	30		6	20	10	2		6	3	100	1000	TO-92(92)
2N4338	50	0.3	1	15	100	0.6	1.8	7	3			TO-18(02)
2N4339	50	0.6	1.8	15	100	0.8	2.4	7	3			TO-18(02)
2N4340	50	1	3	15	100	1.3	3	7	3			TO-18(02)
2N5457	25	0.5	6	15	10	2	5	7	3			TO-92(92)
MMBF5457	25	0.5	6	15	10	2	5	7	3			TO-236*
2N5458	25	1	7	15	10	1.5	5.5	7	3			TO-92(92)
MMBF5458	25	1	7	15	10	1.5	5.5	7	3			TO-236*
2N5459	25	2	8	15	10	2	6	7	3			TO-92(92)
MMBF5459	25	2	8	15	10	2	6	7	3			TO-236*
BF244A	30	0.5	8	15	10	3	6.5	t4	t1.1	t1.5	100	TO-92(94)
BF245A	30	0.5	8	15	10	3	6.5	t4	t1.1			TO-92(97)
BF245B	30	0.5	8	15	10	3	6.5	t4	t1.1			TO-92(97)
BF245C	30	0.5	8	15	10	3	6.5	t4	t1.1			TO-92(97)
BF247B	25	0.6	14.5	15	10	8		t11	t3.5			TO-92(97)
BF256C	30					4.5			t0.7	t7.5	800	TO-92(97)
BSR58	40	0.8	4	15	1				t5			TO-236*
J201	40	0.3	1.5	20	10	0.5						TO-92(92)
MMBFJ201	40	0.3	1.5	20	10	0.5						TO-236*
MMBFJ202	40	0.8	4	20	10	1						TO-236*
J202	40	0.8	4	20	10	1						TO-92(92)
MMBFJ203	40	2	10	20	10	1.5						TO-236*
J211	25	2.5	4.5	15	1	6	12					TO-92(92)

\* TO-236AB is standard for all devices.

Please refer to Surface Mount section for TO-236 Device Marking.

t = typical value



# JFET RF, VHF, UHF Amplifiers

Junction FETs

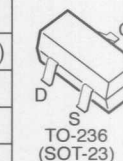
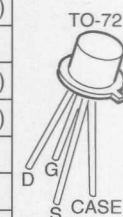
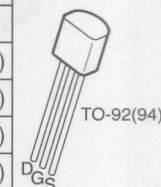
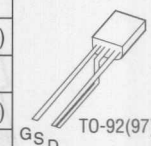
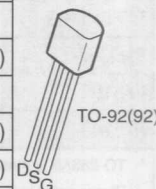
## N Channel

Device	BV <sub>GSS</sub> (V) Min	V <sub>p</sub> @ V <sub>DS</sub> I <sub>D</sub>				Re(Y <sub>f</sub> s) (mmho) @ f		Re(Y <sub>os</sub> ) (μmho) @ f		Ciss (pF) Max	Crss (pF) Max	NF (dB) @ R <sub>g</sub> = 1k		Package
		(V)		(V)	(nA)									
		Min	Max											
2N3819	25		8	15	2	1.6	100			8	4			TO-92(94)
2N4416	30	2.5	6	15	1	4	400	100	400	4	0.9	4	400	TO-72
PN4416	30	2.5	6	15	1	4	400	100	400	4	0.9	4	400	TO-92(92)
MMBF4416	30	2.5	6	15	1	4	400	100	400	4	0.9	4	400	TO-236*
2N5245	30	1	6	15	10	4	400	100	400	4.5	1.0	4	400	TO-92(97)
2N5246	30	0.5	4	15	10	2.5	400	100	400	4.5	1.0	4	400	TO-92(97)
2N5247	30	1.5	8	15	10	4	400	150	400	4.5	1.0	4	400	TO-92(97)
2N5397	25	1	6	10	1	5.5	450	400	450	5	1.2	3.5	450	TO-72
2N5484	25	0.3	3	15	10	2.5	100	75	100	5	1	3	100	TO-92(92)
MMBF5484	25	0.3	3	15	10	2.5	100	75	100	5	1	3	100	TO-236*
2N5485	25	0.5	4	15	10	3	400	100	400	5	1	4	400	TO-92(92)
MMBF5485	25	0.5	4	15	10	3	400	100	400	5	1	4	400	TO-236*
2N5486	25	2	6	15	10	3.5	400	100	400	5	1	4	400	TO-92(92)
MMBF5486	25	2	6	15	10	3.5	400	100	400	5	1	4	400	TO-236*
2N5949	30	3	7	15	100	3	100	150	100	6	2	5	100	TO-92(97)
2N5950	30	2.5	6	15	100	3	100	125	100	6	2	5	100	TO-92(97)
2N5951	30	2	5	15	100	3	100	100	100	6	2	5	100	TO-92(97)
2N5952	30	1.3	4.5	15	100	1	100	75	100	6	2	5	100	TO-92(97)
2N5953	30	0.8	3	15	100	1	100	50	100	6	2	5	100	TO-92(97)
J300	25	1	6	10	1	4.5	0.001	200	0.001	5.5	1.7			TO-92(92)
MMBFJ304	30	2	6	15	1	t4.2	400	t80	100					TO-236*
J304	30	2	6	15	1	t4.2	400	t80	100					TO-92(92)
J305	30	0.5	3	15	1	t3.0	400	t80	100					TO-92(92)
MMBFJ305	30	0.5	3	15	1	t3.0	400	t80	100					TO-236*
MMBFJ309	25	1	4	10	1	10	0.001	150	0.001	7.5	2.5			TO-236*
J309	25	1	4	10	1	10	0.001	150	0.001	7.5	2.5			TO-92(92)
MMBFJ310	25	2	6.5	10	1	8	0.001	150	0.001	7.5	2.5			TO-236*
J310	25	2	6.5	10	1	8	0.001	150	0.001	7.5	2.5			TO-92(92)
U309	25	1	4	10	1	10	0.001	150	100	5	2.5			TO-52
U310	25	2.5	6	10	1	10	0.001	150	100	5	2.5			TO-52

\* TO-236AB is standard for all devices.

Please refer to Surface Mount section for TO-236 Device Marking.

t = typical value



3



# JFET Low Frequency/Low Noise Amplifiers

## N Channel

Device	BV <sub>GSS</sub> (V) Min	V <sub>P</sub> @ V <sub>DS</sub> I <sub>D</sub>				G <sub>fs</sub> (mmho) @ f		Ciss (pF) Max	Crss (pF) Max	en @ Freq		Package
		(V)		(V)	(nA)					Max	(Hz)	
		Min	Max			Min	KHz					
2N4393	40	0.5	3	20	1	t12	1	14	3.5	t8	10	TO-18(02)
MMBF4393	40	0.5	3	20	1	t12	1	14	3.5	t8	10	TO-236*
PN4393	40	0.5	3	20	1	t12	1	14	3.5	t8	10	TO-92(92)
PF5102	40	0.7	1.6	15	1	7.5	1	t12	t4	3.5	1000	TO-92(92)
PF5103	40	1.2	2.7	15	1	7.5	1	t12	t4	3.5	1000	TO-92(92)

\* TO-236AB is standard for all devices.

Please refer to Surface Mount section for TO-236 Device Marking.

t = typical value

3



TO-92(92)



TO-18(02)



TO-236  
(SOT-23)

# JFET Switches/Choppers

## P Channel

Device	BV <sub>GSS</sub> (V) Min	V <sub>P</sub> @ V <sub>DS</sub> I <sub>D</sub>				R <sub>DS(on)</sub> (Ω) @ I <sub>D</sub>		Ciss (pF) Max	Crss (pF) Max	ton (ns) Max	toff (ns) Max	Package
		(V)		(V)	(nA)							
		Min	Max			Min	(mA)					
2N5018	30		10	−15	1000	75	1	45	10	35	65	TO-18(11)
2N5019	30		5	−15	1000	150	1	45	10	90	125	TO-18(11)
MMBF5114	30	5	10	−15	1	75	1	25	7	16	21	TO-236*
2N5115	30	3	6	−15	1	100	1	25	7	30	38	TO-18(11)
MMBF5115	30	3	6	−15	1	100	1	25	7	30	38	TO-236*
2N5116	30	1	4	−15	1	150	1	25	7	42	60	TO-18(11)
MMBF5116	30	1	4	−15	1	150	1	25	7	42	60	TO-236*
MMBFJ174	30	5	10	−15	10	85	1	11	5.5	2	5	TO-236*
J174	30	5	10	−15	10	85	1	11	5.5	2	5	TO-92(94)
MMBFJ175	30	3	6	−15	10	125	0.5	11	5.5	5	10	TO-236*
J175	30	3	6	−15	10	125	0.5	11	5.5	5	10	TO-92(94)
MMBFJ176	30	1	4	−15	10	250	0.25	11	5.5	15	15	TO-236*
J176	30	1	4	−15	10	250	0.25	11	5.5	15	15	TO-92(94)
MMBFJ177	30	0.8	2.25	−15	10	300	0.1	11	5.5	20	20	TO-236*
J177	30	0.8	2.25	−15	10	300	0.1	11	5.5	20	20	TO-92(94)
P1086	30		10	−15	1000	75	1	45	10	35	65	TO-92(92)
P1087	30		5	−15	1000	150	1	45	10	90	125	TO-92(92)

\* TO-236AB is standard for all devices.

Please refer to Surface Mount section for TO-236 Device Marking.



TO-92(92)



TO-92(94)



TO-236  
(SOT-23)



TO-18(11)



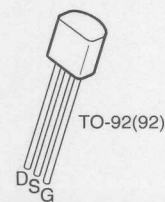
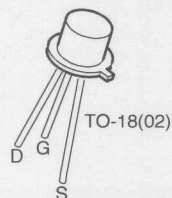
# JFET Switches/Choppers (continued)

## N Channel

Device	BV <sub>GSS</sub> (V) Min	V <sub>P</sub> @ V <sub>DS</sub> I <sub>D</sub>				R <sub>DS(on)</sub> (Ω) @ I <sub>D</sub>		Ciss (pF) Max	Crss (pF) Max	ton (ns) Max	toff (ns) Max	Package
		(V)		(V)	(nA)							
		Min	Max			Min	(mA)					
2N3971	40	2	5	20	1	60	1	25	6	30	60	TO-18(02)
2N4091	40	5	10	20	1	30	1	16	5	25	40	TO-18(02)
MMBF4091	40	5	10	20	1	30	1	16	5	25	40	TO-236*
PN4091	40	5	10	20	1	30	1	16	5	25	40	TO-92(92)
2N4092	40	2	7	20	1	50	1	16	5	35	60	TO-18(02)
MMBF4092	40	2	7	20	1	50	1	16	5	35	60	TO-236*
PN4092	40	2	7	20	1	50	1	16	5	35	60	TO-92(92)
2N4093	40	1	5	20	1	80	1	16	5	60	80	TO-18(02)
MMBF4093	40	1	5	20	1	80	1	16	5	60	80	TO-236*
PN4093	40	1	5	20	1	80	1	16	5	60	80	TO-92(92)
2N4391	40	4	10	20	1	30	1	14	3.5	15	20	TO-18(02)
MMBF4391	40	4	10	20	1	30	1	14	3.5	15	20	TO-236*
PN4391	40	4	10	20	1	30	1	14	3.5	15	20	TO-92(92)
2N4392	40	2	5	20	1	60	1	14	3.5	15	35	TO-18(02)
MMBF4392	40	2	5	20	1	60	1	14	3.5	15	35	TO-236*
PN4392	40	2	5	20	1	60	1	14	3.5	15	35	TO-92(92)
2N4393	40	0.5	3	20	1	100	1	14	3.5	15	55	TO-18(02)
MMBF4393	40	0.5	3	20	1	100	1	14	3.5	15	55	TO-236*
PN4393	40	0.5	3	20	1	100	1	14	3.5	15	55	TO-92(92)
2N4856	40	4	10	15	0.5	25		18	8	9	25	TO-18(02)
2N4858	40	0.8	4	15	0.5	60		18	8	20	100	TO-18(02)
PN4858	40	0.8	4	15	0.5	60		18	8	20	100	TO-92(92)
2N4859	30	4	10	15	0.5	25		18	8	9	25	TO-18(02)
MMBF4859	30	4	10	15	0.5	25		18	8	9	25	TO-236*
2N4860	30	2	6	15	0.5	40		18	8	10	50	TO-18(02)
MMBF4860	30	2	6	15	0.5	40		18	8	10	50	TO-236*

\* TO-236AB is standard for all devices.

Please refer to Surface Mount section for TO-236 Device Marking.



# JFET Switches/Choppers (continued)

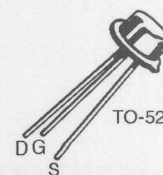
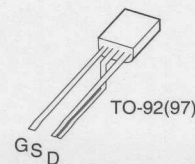
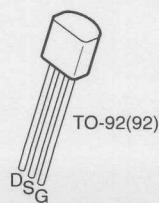
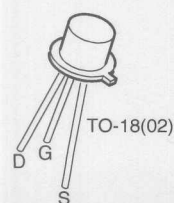
## N Channel (Continued)

Junction FETS

Device	BV <sub>GSS</sub> (V) Min	V <sub>P</sub> @ V <sub>DS</sub> I <sub>D</sub>				R <sub>DS(on)</sub> (Ω) @ I <sub>D</sub>		C <sub>iss</sub> (pF) Max	C <sub>rss</sub> (pF) Max	ton (ns) Max	toff (ns) Max	Package
		(V)		(V)	(nA)							
		Min	Max			Min	(mA)					
2N4860A	30	2	6	15	0.5	40		10	3.5	10	40	TO-18(02)
2N4861	30	0.8	4	15	0.5	60		18	8	20	100	TO-18(02)
MMBF4861	30	0.8	4	15	0.5	60		18	8	20	100	TO-236*
2N5432	25	4	10	5	3	5	10	30	15	5	36	TO-52
PN5432	25	4	10	5	3	5	10	30	15	5	36	TO-92(92)
2N5433	25	3	9	5	3	7	10	30	15	5	36	TO-52
2N5434	25	1	4	5	3	10	10	30	15	5	36	TO-52
PN5434	25	1	4	5	3	10	10	30	15	5	36	TO-92(92)
2N5555	25		10	12	10	150		5	1.2	10	25	TO-92(92)
2N5638	30		12	15	1	30	1	10	4	4	15	TO-92(92)
2N5639	30		8	15	1	60	1	10	4	14	30	TO-92(92)
J105	25	4.5	10	5	1000	3	33					TO-92(92)
J106	25	2	6	5	1000	6	17					TO-92(92)
J108	25	3	10	5	1000	8	10					TO-92(92)
J109	25	2	6	5	1000	12	10					TO-92(92)
J110	25	0.5	4	5	1000	18	10					TO-92(92)
MMBFJ111	35	3	10	5	1000	30	1					TO-236*
J111	35	3	10	5	1000	30	1					TO-92(92)
MMBFJ112	35	1	5	5	1000	50	1					TO-236*
J112	35	1	5	5	1000	50	1					TO-92(92)
MMBFJ113	35	0.5	3	5	1000	100	1					TO-236*
J113	35	0.5	3	5	1000	100	1					TO-92(92)
TIS74	30	2	6	15	4	40		18	8	10	50	TO-92(97)
TIS75	30	0.8	4	15	4	60		18	8	20	100	TO-92(97)
U1897	40	5	10	20	1	30	1	16	3.5	25	40	TO-92(92)
U1898	40	2	7	20	1	50	1	16	3.5	35	60	TO-92(92)
U1899	40	1	5	20	1	80	1	16	3.5	60	80	TO-92(92)

\* TO-236AB is standard for all devices.

Please refer to Surface Mount section for TO-236 Device Marking.



# JFET Ultra Low Input Current Amplifiers

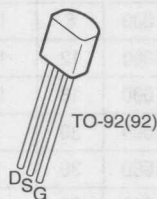
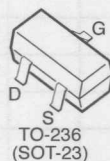
## N Channel

Device	BV <sub>GSS</sub> (V) Min	I <sub>GSS</sub> (pA) Max	V <sub>P</sub> @ V <sub>DS</sub> I <sub>D</sub>				G <sub>fs</sub> (μmho)		Ciss (pF) Max	Crss (pF) Max	Package
			(V)		(V)	(nA)					
			Min	Max			Min	Max			
MMBF4117	40	10	0.6	2.8	10	1	20	210	3	1.5	TO-236*
PN4117	40	10	0.6	2.8	10	1	20	210	3	1.5	TO-92(92)
2N4118	40	10	1	3	10	1	80	250	3	1.5	TO-72
MMBF4118	40	10	1	3	10	1	80	250	3	1.5	TO-236*
MMBF4119	40	10	2	6	10	1	100	330	3	1.5	TO-236*
2N4117A	40	1	0.6	1.8	10	1	70	210	3	1.5	TO-72
PN4117A	40	1	0.6	2.8	10	1	70	210	3	1.5	TO-92(92)
2N4118A	40	1	1	3	10	1	80	250	3	1.5	TO-72

\* TO-236AB is standard for all devices.

Please refer to Surface Mount section for TO-236 Device Marking.

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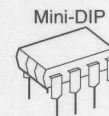
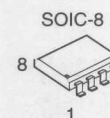
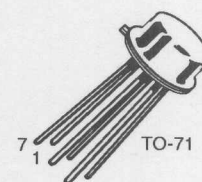
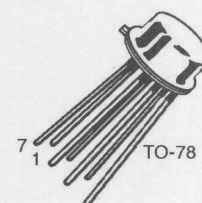
# Dual JFETs

Junction FETS

## N Channel

Device	V <sub>P</sub>		G <sub>fs</sub> (mmho)		V <sub>GS1-2</sub> V <sub>OS</sub> (mV) Max	Drift ( $\mu$ V/C) $\Delta$ V <sub>GS</sub> Max	I <sub>DSS</sub> Match %	G <sub>fs</sub> Match %	Package
	(V) Min	Max	Min	Max					
2N3955	1	4.5	1	3	10	25	5	5	TO-71
2N3956	1	4.5	1	3	15	50	5	5	TO-71
2N3958	1	4.5	1	3	25	100	15	15	TO-71
2N5197	0.7	4.0	1	4	5	10	5	3	TO-71
2N5564	0.5	3	7.5	12.5	5	10	5	5	TO-71
2N5565	0.5	3	7.5	12.5	10	25	5	10	TO-71
2N5566	0.5	3	7.5	12.5	20	50	5	10	TO-71
2N5906	0.6	4.5	70 $\mu$	0.25	5	5	5	3	TO-78
2N5908	0.6	4.5	70 $\mu$	0.25	10	20	5	5	TO-78
2N5909	0.6	4.5	70 $\mu$	0.25	15	40	5	5	TO-78
2N5911	1	5	5	10	10	20	5	5	TO-78
2N5912	1	5	5	10	15	40	5	5	TO-78
2N6485	0.7	4	1	4	15	25	5	5	TO-71
NPD5564	0.5	3	7.5	12.5	5	10	5	5	Mini-Dip
NPD5565	0.5	3	7.5	12.5	10	25	5	10	Mini-Dip
NPD5566	0.5	3	7.5	12.5	20	50	5	10	Mini-Dip
NPD8303	0.5	3.5	1	4	15	t15			Mini-Dip
NPDS404	0.5	2.5	2	7	15	25			SOIC-8
NPDS405	0.5	2.5	2	7	20	40			SOIC-8
NPDS406	0.5	2.5	2	7	40	80			SOIC-8
NPDS5564	0.5	3	7.5	12.5	5	10		5	SOIC-8
NPDS5565	0.5	3	7.5	12.5	10	25		10	SOIC-8
NPDS5566	0.5	3	7.5	12.5	20	50		10	SOIC-8
NPDS5911	1	5	5	10	10	20	5	5	SOIC-8
NPDS5912	1	5	5	10	15	40	5	5	SOIC-8
U257	1	5	5	10	100		15	15	TO-78
U401	0.5	2.5	2	7	5	10			TO-71
U403	0.5	2.5	2	7	10	25			TO-71
U406	0.5	2.5	2	7	40	80			TO-71

t=typical value



3







# Diodes

Silicon Single Junction Diodes .....	4-1
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# Silicon Single Junction Diodes

$V_{RRM}$ (Volts) Min	Device	$I_{RRM}$ (nA) Max	$V_{FM}$ @ $I_F$		$t_{rr}$ (ns) Max	Package*
			(Volts) Max	(mA)		
250	1N486B	50	1.0	100		DO-35
	BAV21	100	1.0	100	50	DO-35
200	1N3070	100	1.0	100	50	DO-35
	1N459	25	1.0	3.0		DO-35
	1N459A	25	1.0	100		DO-35
	1N485B	25	1.0	100		DO-35
	1N4938	100	1.0	100	50	DO-35
	1S923	100	1.2	200		DO-35
	BAS21	100	1.0	100	50	TO-236*(1)
	BAV20	100	1.0	100	50	DO-35
	FDH400	100	1.0	200	50	DO-35
	MMBD1401	100	1.0	200	50	TO-236*(1)
	MMBD1402	100	1.0	200	50	TO-236*(2)
	MMBD1403	100	1.0	200	50	TO-236*(3)
	MMBD1404	100	1.0	200	50	TO-236*(4)
	MMBD1405	100	1.0	200	50	TO-236*(5)
	MMBD1501A	1.0	1.1	200		TO-236*(1)
	MMBD1502A	1.0	1.1	200		TO-236*(2)
	MMBD1503A	1.0	1.1	200		TO-236*(3)
	MMBD1504A	1.0	1.1	200		TO-236*(4)
	MMBD1505A	1.0	1.1	200		TO-236*(5)
150	1N3595	1.0	1.0	200		DO-35
	1N458A	25	1.0	100		DO-35
	1N6099	1.0	1.0	200		DO-35

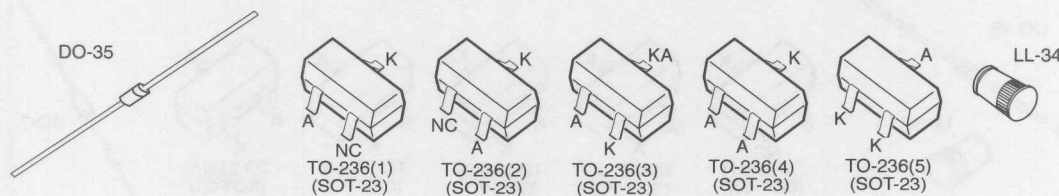
\* TO-236AB is standard for all devices.

Please see Surface Mount section for LL-34 and TO-236 Device Marking.

$V_{RRM}$ (Volts) Min	Device	$I_{RRM}$ (nA) Max	$V_{FM}$ @ $I_F$		$t_{rr}$ (ns) Max	Package*
			(Volts) Max	(mA)		
150	1S922	100	1.2	200		DO-35
	BAS20	100	1.0	100	50	TO-236*(1)
	BAX16	100	1.0	1.0	120	DO-35
	FDH300A	1.0	1.0	200		DO-35
	FDH333	3.0	1.05	200		DO-35
	FDH444	50	1.1	200	60	DO-35
	FDLL300	1.0	1.0	200		LL-34*
	FDLL3595	1.0	1.0	200		LL-34*
125	BAY72	100	1.0	100	50	DO-35
	BAY73	5	1.0	200		DO-35
120	BAV19	100	1.0	100	50	DO-35
	BAY80	100	1.0	150		DO-35
	BAS19	100	1.0	100	50	TO-236*(1)
	BAS29	100	0.84	50	50	TO-236*(1)
	BAS31	100	0.84	50	50	TO-236*(3)
	BAS35	100	0.84	50	50	TO-236*(5)
100	1N4148	25	1.0	10	4.0	DO-35
	1N4149	25	1.0	10	4.0	DO-35
	1N4446	25	1.0	20	4.0	DO-35
	1N4447	25	1.0	20	4.0	DO-35
	1N4448	25	1.0	100	4.0	DO-35
	1N914	25	1.0	10	4.0	DO-35
	1N914A	25	1.0	20	4.0	DO-35
	1N914B	25	1.0	100	4.0	DO-35

\* TO-236AB is standard for all devices.

Please see Surface Mount section for LL-34 and TO-236 Device Marking.



# Silicon Single Junction Diodes (continued)

$V_{RRM}$ (Volts) Min	Device	$I_{RRM}$ (nA) Max	$V_{FM}$ @ $I_F$		$t_{rr}$ (ns) Max	Package*
			(Volts) Max	(mA)		
100	1N916	25	1.0	10	4.0	DO-35
	1N916B	25	1.0	30	4.0	DO-35
	1S921	100	1.2	200		DO-35
	FDLL4148	25	1.0	10	4.0	LL-34*
	FDLL4448	25	1.0	100	4.0	LL-34*
	FDLL914	25	1.0	10	4.0	LL-34*
	MMBD1201	25	1.0	200	4.0	TO-236*(1)
	MMBD1202	25	1.0	200	4.0	TO-236*(2)
	MMBD1203	25	1.0	200	4.0	TO-236*(3)
	MMBD1204	25	1.0	200	4.0	TO-236*(4)
	MMBD1205	25	1.0	200	4.0	TO-236*(5)
	MMBD4148	25	1.0	10	4.0	TO-236*(1)
	MMBD914	25	1.0	10	4.0	TO-236*(1)
80	1N483B	25	1.0	100		DO-35
	1N5282	100	1.3	500	2.0	DO-35
75	1N3064	100	1.0	10	4.0	DO-35
	1N3600	100	1.0	200	4.0	DO-35
	1N4150	100	1.0	200	4.0	DO-35
	1N4151	50	1.0	50	2.0	DO-35
	1N4153	50	0.88	20	2.0	DO-35
	1N4305	100	0.85	10	2.0	DO-35
	1N4454	100	1.0	10	4.0	DO-35
	BAS16	1000	1.1	50	6.0	TO-236*(1)
	BAW62	25	1.0	100	4.0	DO-35
	BAW76	100	1.0	100	2.0	DO-35
	FDH600	100	1.0	200	4.0	DO-35

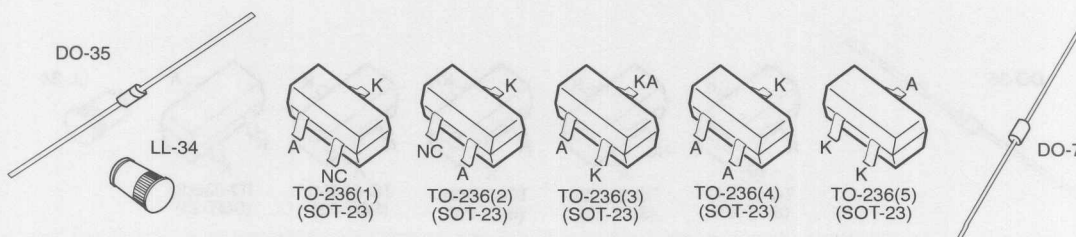
\* TO-236AB is standard for all devices.

Please see Surface Mount section for LL-34 and TO-236 Device Marking.

$V_{RRM}$ (Volts) Min	Device	$I_{RRM}$ (nA) Max	$V_{FM}$ @ $I_F$		$t_{rr}$ (ns) Max	Package*
			(Volts) Max	(mA)		
75	FDLL4150	100	1.0	200	4.0	LL-34*
	FDLL600	100	1.0	200	4.0	LL-34*
70	1N457	25	1.0	20		DO-35
	1N457A	25	1.0	100		DO-35
	BAV70	5000	1.1	50	6.0	TO-236*(4)
	BAV99	2500	1.1	50	6.0	TO-236*(3)
	BAW56	2500	1.1	50	6.0	TO-236*(5)
60	BAV18	100	1.0	100	50	DO-35
50	1S920	100	1.2	200		DO-35
	BAV74	100	1.0	100	4.0	TO-236*(4)
	BAY71	100	1.0	20	2.0	DO-35
40	1N4152	50	0.88	20	2.0	DO-35
35	1N4154	100	1.0	30	2.0	DO-35
30	1N456A	25	1.0	100		DO-35
	FD700	50	1.1	50	0.70	DO-7
	FJT1100	0.001	1.05	10		DO-7
	MMBD1701	50	1.1	50	0.70	TO-236*(1)
	MMBD1702	50	1.1	50	0.70	TO-236*(2)
	MMBD1703	50	1.1	50	0.70	TO-236*(3)
	MMBD1704	50	1.1	50	0.70	TO-236*(4)
	MMBD1705	50	1.1	50	0.70	TO-236*(5)
20	1N4244	100	1.0	20	0.75	DO-7
	1N4376	100	1.1	50	0.75	DO-7
	FJT1101	0.005	1.1	50		DO-7
15	BAY82	100	1.0	20	0.75	DO-7
	FD777	100	1.0	20	0.75	DO-7

\* TO-236AB is standard for all devices.

Please see Surface Mount section for LL-34 and TO-236 Device Marking.



# Zeners

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# DO-35 Half Watt Zener Diodes

Zeners

V <sub>Z</sub> (Volts)	Tolerance 5%	I <sub>ZT</sub> (mA)	Z <sub>Z</sub> (Ω)	I <sub>R</sub> (μA)
3.3	1N746A	20	28	10
3.6	1N747A	20	24	10
3.9	1N748A	20	23	10
4.3	1N749A	20	22	2
4.7	1N750A	20	19	2
5.1	1N751A	20	17	1
5.6	1N752A	20	11	1
6.0				
6.2	1N753A	20	7.0	0.1
6.8	1N754A	20	5.0	0.1
	1N957B	18.5	4.5	150
7.5	1N755A	20	6.0	0.1
	1N958B	16.5	5.5	75
8.2	1N756A	20	8.0	0.1
	1N959B	15	6.5	50
8.7				
9.1	1N757A	20	10	0.1
	1N960B	14	7.5	25
10	1N758A	20	17	0.1
	1N961B	12.5	8.5	10
11	1N962B	11.5	9.5	5.0
12	1N759A	20	30	0.1
	1N963B	10.5	11.5	5.0
13	1N964B	9.5	13	5.0
14				
15	1N965B	8.5	16	5.0
16	1N966B	7.8	17	5.0
17				
18	1N967B	7.0	21	5.0
19				
20	1N968B	6.2	25	5.0
22	1N969B	5.6	29	5.0
24	1N970B	5.2	33	5.0
25				
27	1N971B	4.6	41	5.0
28				
30	1N972B	4.2	49	5.0
33	1N973B	3.8	58	5.0

V <sub>Z</sub> (Volts)	Tolerance 5%	I <sub>ZT</sub> (mA)	Z <sub>Z</sub> (Ω)	I <sub>R</sub> (μA)
3.3	1N5226B	20	28	25
3.6	1N5227B	20	24	15
3.9	1N5228B	20	23	10
4.3	1N5229B	20	22	5.0
4.7	1N5230B	20	19	5.0
5.1	1N5231B	20	17	5.0
5.6	1N5232B	20	11	5.0
6.0	1N5233B	20	7.0	5.0
6.2	1N5234B	20	7.0	3.0
6.8	1N5235B	20	5.0	3.0
7.5	1N5236B	20	6.0	3.0
8.2	1N5237B	20	8.0	3.0
8.7	1N5238B	20	8.0	3.0
9.1	1N5239B	20	10	3.0
10	1N5240B	20	17	3.0
11	1N5241B	20	22	2.0
12	1N5242B	20	30	1.0
13	1N5243B	9.5	13	0.5
14	1N5244B	9.0	15	0.1
15	1N5245B	8.5	16	0.1
16	1N5246B	7.8	17	0.1
17	1N5247B	7.4	19	0.1
18	1N5248B	7.0	21	0.1
19	1N5249B	6.6	23	0.1
20	1N5250B	6.2	25	0.1
22	1N5251B	5.6	29	0.1
24	1N5252B	5.2	33	0.1
25	1N5253B	5.0	35	0.1
27	1N5254B	4.6	41	0.1
28	1N5255B	4.5	44	0.1
30	1N5256B	4.2	49	0.1
33	1N5257B	3.8	58	0.1

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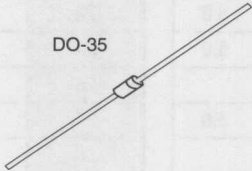
DO-35 Half Watt Zener Diodes (continued)

V <sub>Z</sub> (Volts)	Tolerance 5%	I <sub>ZT</sub> (mA)	Z <sub>Z</sub> (Ω)	I <sub>R</sub> (μA)
3.3	BZX55C3V3	5.0	85	2.0
3.6	BZX55C3V6	5.0	85	2.0
3.9	BZX55C3V9	5.0	85	2.0
4.3	BZX55C4V3	5.0	75	1.0
4.7	BZX55C4V7	5.0	60	0.5
5.1	BZX55C5V1	5.0	35	0.1
5.6	BZX55C5V6	5.0	25	0.1
6.2	BZX55C6V2	5.0	10	0.1
6.8	BZX55C6V8	5.0	8.0	0.1
7.5	BZX55C7V5	5.0	7.0	0.1
8.2	BZX55C8V2	5.0	7.0	0.1
9.1	BZX55C9V1	5.0	10	0.1
10	BZX55C10	5.0	15	0.1
11	BZX55C11	5.0	20	0.1
12	BZX55C12	5.0	20	0.1
13	BZX55C13	5.0	26	0.1
15	BZX55C15	5.0	30	0.1
16	BZX55C16	5.0	40	0.1
18	BZX55C18	5.0	50	0.1
20	BZX55C20	5.0	55	0.1
22	BZX55C22	5.0	55	0.1
24	BZX55C24	5.0	80	0.1
27	BZX55C27	5.0	80	0.1
30	BZX55C30	5.0	80	0.1
33	BZX55C33	5.0	80	0.1

V <sub>Z</sub> (Volts)	Tolerance 5%	I <sub>ZT</sub> (mA)	Z <sub>Z</sub> (Ω)	I <sub>R</sub> (μA)
3.3	BZX79C3V3	5.0	95	2.0
3.6	BZX79C3V6	5.0	90	2.0
3.9	BZX79C3V9	5.0	90	2.0
4.3	BZX79C4V3	5.0	90	1.0
4.7	BZX79C4V7	5.0	80	3.0
5.1	BZX79C5V1	5.0	60	2.0
5.6	BZX79C5V6	5.0	40	1.0
6.2	BZX79C6V2	5.0	10	3.0
6.8	BZX79C6V8	5.0	15	2.0
7.5	BZX79C7V5	5.0	15	0.1
8.2	BZX79C8V2	5.0	15	0.1
9.1	BZX79C9V1	5.0	15	0.1
10	BZX79C10	5.0	20	0.1
11	BZX79C11	5.0	20	0.1
12	BZX79C12	5.0	25	0.1
13	BZX79C13	5.0	30	0.1
15	BZX79C15	5.0	30	0.1
16	BZX79C16	5.0	40	0.1
18	BZX79C18	5.0	45	0.1
20	BZX79C20	5.0	55	0.1
22	BZX79C22	5.0	55	0.1
24	BZX79C24	5.0	70	0.1
27	BZX79C27	2.0	80	0.1
30	BZX79C30	2.0	80	0.1
33	BZX79C33	2.0	80	0.1

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DO-35



# TO-236AB (SOT-23 Zener Diodes)

Zeners



V <sub>Z</sub> (Volts)	Tolerance 5%	I <sub>ZT</sub> (mA)	Z <sub>Z</sub> (Ω)	I <sub>R</sub> (μA)
3.3	MMBZ5226B	20	28	25
3.6	MMBZ5227B	20	24	15
3.9	MMBZ5228B	20	23	10
4.3	MMBZ5229B	20	22	5.0
4.7	MMBZ5230B	20	19	5.0
5.1	MMBZ5231B	20	17	5.0
5.6	MMBZ5232B	20	11	5.0
6.0	MMBZ5233B	20	7.0	5.0
6.2	MMBZ5234B	20	7.0	5.0
6.8	MMBZ5235B	20	5.0	3.0
7.5	MMBZ5236B	20	6.0	3.0
8.2	MMBZ5237B	20	8.0	3.0
8.7	MMBZ5238B	20	8.0	3.0
9.1	MMBZ5239B	20	10	3.0
10	MMBZ5240B	20	17	3.0
11	MMBZ5241B	20	22	2.0
12	MMBZ5242B	20	30	1.0
13	MMBZ5243B	9.5	13	0.5
14	MMBZ5244B	9.0	15	0.1
15	MMBZ5245B	8.5	16	0.1
16	MMBZ5246B	7.8	17	0.1
17	MMBZ5247B	7.4	19	0.1
18	MMBZ5248B	7.0	21	0.1
19	MMBZ5249B	6.6	23	0.1
20	MMBZ5250B	6.2	25	0.1
22	MMBZ5251B	5.6	29	0.1
24	MMBZ5252B	5.2	33	0.1
25	MMBZ5253B	5.0	35	0.1
27	MMBZ5254B	4.6	41	0.1
28	MMBZ5255B	4.5	44	0.1
30	MMBZ5256B	4.2	49	0.1
33	MMBZ5257B	3.8	58	0.1

Please refer to Surface Mount section for TO-236 Device Marking.

V <sub>Z</sub> (Volts)	Tolerance 5%	I <sub>ZT</sub> (mA)	Z <sub>Z</sub> (Ω)	I <sub>R</sub> (μA)
3.3				
3.6				
3.9				
4.3				
4.7	BZX84C4V7	5.0	80	3.0
5.1	BZX84C5V1	5.0	60	2.0
5.6	BZX84C5V6	5.0	40	1.0
6.0				
6.2	BZX84C6V2	5.0	10	3.0
6.8	BZX84C6V8	5.0	15	2.0
7.5	BZX84C7V5	5.0	15	1.0
8.2	BZX84C8V2	5.0	15	0.7
8.7				
9.1	BZX84C9V1	5.0	15	0.5
10	BZX84C10	5.0	20	0.2
11	BZX84C11	5.0	20	0.1
12	BZX84C12	5.0	25	0.1
13	BZX84C13	5.0	30	0.1
14				
15	BZX84C15	5.0	30	0.05
16	BZX84C16	5.0	40	0.05
17				
18	BZX84C18	5.0	45	0.05
19				
20	BZX84C20	5.0	55	0.05
22	BZX84C22	5.0	55	0.05
24	BZX84C24	5.0	70	0.05
25				
27	BZX84C27	2.0	80	0.05
28				
30	BZX84C30	2.0	80	0.05
33	BZX84C33	2.0	80	0.05

Please refer to Surface Mount section for TO-236 Device Marking.

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DO-41 1 Watt Zener  
Diodes

DO-41 1.3 Watt Zener  
Diodes

V <sub>Z</sub> (Volts)	Tolerance 5%	I <sub>ZT</sub> (mA)	Z <sub>Z</sub> (Ω)	I <sub>R</sub> (μA)
3.3	1N4728A	76	10	100
3.6	1N4729A	69	10	100
3.9	1N4730A	64	9.0	50
4.3	1N4731A	58	9.0	10
4.7	1N4732A	53	8.0	10
5.1	1N4733A	49	7.0	10
5.6	1N4734A	45	5.0	10
6.2	1N4735A	41	2.0	10
6.8	1N4736A	37	3.5	10
7.5	1N4737A	34	4.0	10
8.2	1N4738A	31	4.5	10
9.1	1N4739A	28	5.0	10
10	1N4740A	25	7.0	10
11	1N4741A	23	8.0	5.0
12	1N4742A	21	9.0	5.0
13	1N4743A	19	10	5.0
15	1N4744A	17	14	5.0
16	1N4745A	15.5	16	5.0
18	1N4746A	14	20	5.0
20	1N4747A	12.5	22	5.0
22	1N4748A	11.5	23	5.0
24	1N4749A	10.5	25	5.0
27	1N4750A	9.5	35	5.0
30	1N4751A	8.5	40	5.0
33	1N4752A	7.5	45	5.0

V <sub>Z</sub> (Volts)	Tolerance 5%	I <sub>ZT</sub> (mA)	Z <sub>Z</sub> (Ω)	I <sub>R</sub> (μA)
3.3	BZX85C3V3	80	20	60
3.6	BZX85C3V6	60	15	30
3.9	BZX85C3V9	60	15	5.0
4.3	BZX85C4V3	50	13	3.0
4.7	BZX85C4V7	45	13	1.0
5.1	BZX85C5V1	45	10	1.0
5.6	BZX85C5V6	45	7.0	1.0
6.2	BZX85C6V2	35	4.0	1.0
6.8	BZX85C6V8	35	3.5	1.0
7.5	BZX85C7V5	35	3.0	1.0
8.2	BZX85C8V2	25	5.0	1.0
9.1	BZX85C9V1	25	5.0	1.0
10	BZX85C10	25	7.0	0.5
11	BZX85C11	20	8.0	0.5
12	BZX85C12	20	9.0	0.5
13	BZX85C13	20	10	0.5
15	BZX85C15	15	15	0.5
16	BZX85C16	15	15	0.5
18	BZX85C18	15	20	0.5
20	BZX85C20	10	24	0.5
22	BZX85C22	10	25	0.5
24	BZX85C24	10	25	0.5
27	BZX85C27	8.0	30	0.5
30	BZX85C30	8.0	30	0.5
33	BZX85C33	8.0	35	0.5

5





# Bipolar Transistors

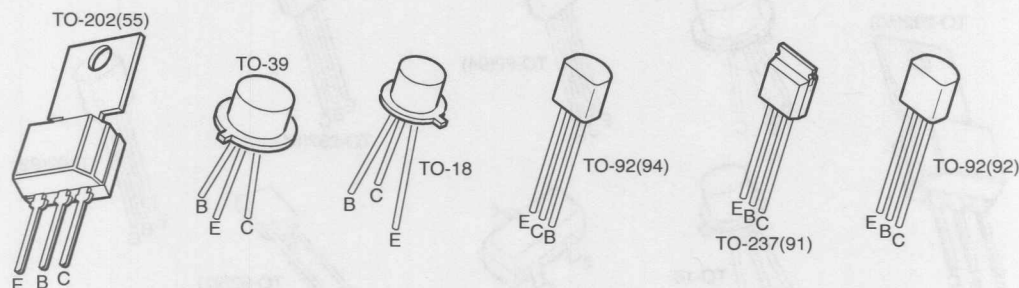
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# General Purpose Amplifiers and Switches

$V_{CE0(sust)}$ (Volts) Min	Devices		$I_C$ (mA) Max	$h_{FE} @ I_C$			$f_T @ I_C$		NF (dB) Max	Package	$P_D (Amb)$ (mW) @25°C
	NPN	PNP		Min	Max	mA	(MHz) Min	mA			
100	2N6553		1000	80	250	50	75	100		TO-202(55)	1333
	2N6718	2N6730	1000	50	250	250	50	200		TO-237(91)	850
	NSDU07		1000	50		250	50	200		TO-202(55)	2000
80	2N3019		1000	100	300	150	100	50		TO-39	800
	2N3700		1000	100	300	150	80	1.0		TO-18	500
	2N6707		1000	40	250	250	50	200		TO-237(90)	850
	2N6717	2N6729	1000	50	250	250	50	200		TO-237(91)	850
	2N6731	2N6732	1000	100	300	350	50	200		TO-237(91)	850
	BC639	BC640	1500	40	250	150	130 Typ	100		TO-92(94)	625
	D40E7		1000	50		100	200 Typ	20		TO-202(55)	1333
	MPSA06	MPSA56	50	50	—	100	100	10		TO-92(92)	625
	NSD105		1500	120	360	100	60	50		TO-202(55)	2000
	TN3019		1000	100	300	150	100	50		TO-237(91)	850
		2N4033	1000	100	300	100	150	50		TO-39	800
		2N6555	1000	80	300	50	75	50		TO-202(55)	1333
		PN4356	500	50	250	10	100	50		TO-92(92)	625
		TN4033	1000	100	300	100	150	50		TO-237(91)	850
75	2N5320	2N5322	2000	30	250	500	50	50		TO-39	800

\* TO-236AB is standard for all devices.  
Please refer to Surface Mount section for TO-236 Device Marking.

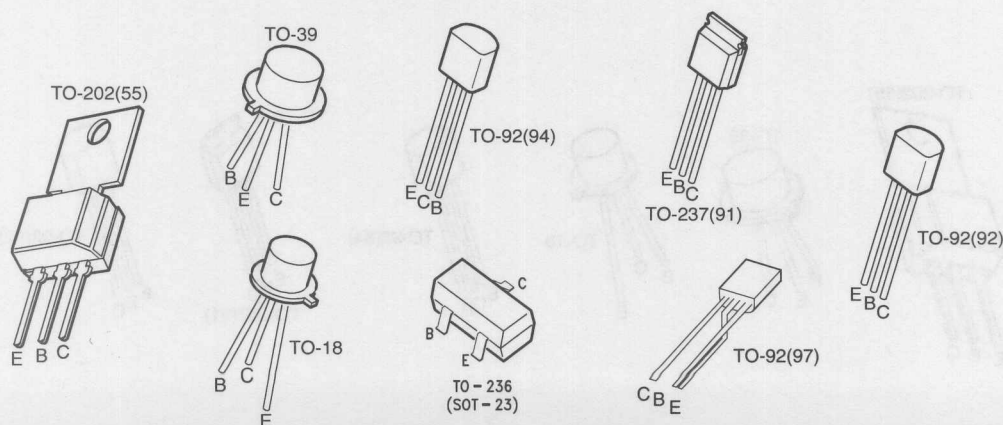


# General Purpose Amplifiers and Switches (continued)

$V_{CEO(sust)}$ (Volts) Min	Devices		$I_C$ (mA) Max	$h_{FE} @ I_C$			$f_T @ I_C$		NF (dB) Max	Package	$P_D (Amb)$ (mW) @25°C
	NPN	PNP		Min	Max	mA	(MHz) Min	mA			
65	BC546		100	110	450	2.0	300 Typ	10	10	TO-92(97)	625
	BC846		100	110		0.01	300 Typ	10	10	TO-236*	350
					450	2.0				TO-236*	
		2N4036	1000	40	140	150	60	50		TO-39	1000
		BC556	100	75	475	2.0	300 Typ	10	10	TO-92(97)	625
		BC856	100	125	475	2.0	300 Typ	10	10	TO-236*	350
		TN4036	1000	40	140	150	60	50		TO-237(91)	850
60	2N2484		50	100	500	0.01	15	0.5		TO-18	360
	2N3859A		100	100	200	10	90	2.0		TO-92(94)	625
	2N5961		50	150	700	10	100	10	3.0	TO-18	400
	2N6551		1000	80	300	50	75	100		TO-202(55)	1333
	2N6716	2N6728	1000	50	250	250	50	200		TO-237(91)	850
	BC637	BC639	1500	40	250	150	130 Typ	100		TO-92(94)	625
	MPS8098		500	100	300	1.0	150	10		TO-92(92)	625
	MPSA05	MPSA55	500	50		100	100	10		TO-92(92)	625
	NSDU05	NSDU55	1500	50		250	50	200		TO-202(55)	1333
	PN3568		500	40	120	150	60	50		TO-92(92)	625
	TIS98		200	100	300	1.0	200	10		TO-92(97)	625
		2N2904A	600	40	120	150	200	50		TO-39	600
		2N2905A	600	100	300	150	200	50		TO-39	600
		2N2907A	600	100	300	150	200	50		TO-18	400
		2N3962	200	100	300	0.01	40	0.5		TO-18	360

\* TO-236AB is standard for all devices.  
Please refer to Surface Mount section for TO-236 Device Marking.

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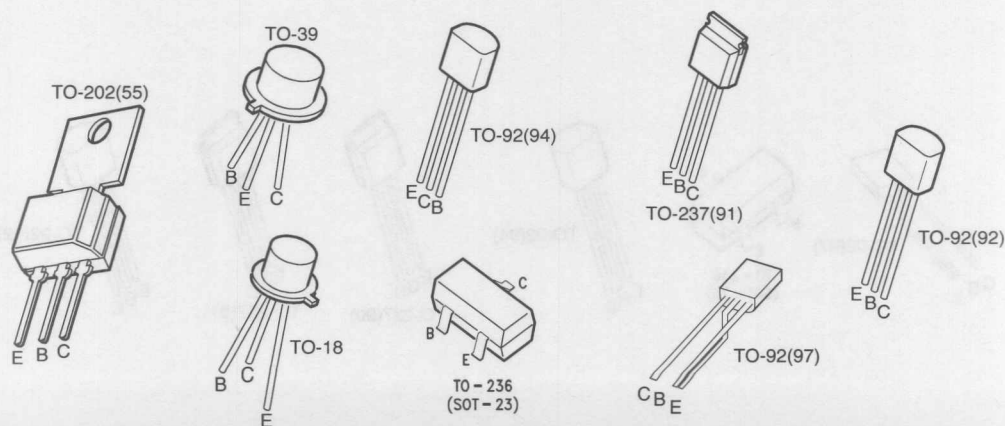


# General Purpose Amplifiers and Switches (continued)

$V_{CE0(sust)}$ (Volts) Min	Devices		$I_C$ (mA) Max	$h_{FE} @ I_C$			$f_T @ I_C$		NF (dB) Max	Package	$P_D (Amb)$ (mW) @25°C
	NPN	PNP		Min	Max	mA	(MHz) Min	mA			
60		2N4032	1000	100	300	100	150	50		TO-39	800
		2N6554	1500	80	300	50	75	50		TO-202(55)	1333
		MMBT2907A	600	100	300	150	200	50		TO-236*	350
		PN2907A	600	100	300	150	200	50		TO-92(92)	625
		PN3645	500	100	300	150	200	20		TO-92(92)	625
		PN4249	100	100	300	0.1	40	0.5	3.0	TO-92(92)	625
		PN4250A	100	250	700	0.1	40	0.5	2.0	TO-92(92)	625
		PN4355	500	100	400	10	100	50		TO-92(92)	625
		TN2905A	600	100	300	150	200	50		TO-237(91)	850
50	2N3416		500	75	225	2.0				TO-92(94)	360
	2N3417		500	180	540	2.0				TO-92(94)	360
	2N956		1000	50	200	150	70	50		TO-18	500
	BC182		100	125	500	2.0	150	10	10	TO-92(97)	625
		2N5323	2000	40	250	500	50	50		TO-39	
		BC212	100	60	400	2.0	200	10	10	TO-92(97)	625
45	2N2270		1000	50	200	150	100	50		TO-39	1000
	2N5962		50	600	1400	10	100	10	3.0	TO-18	400
	2N930		200	100	300	0.01	150	5		TO-18	300
	BC237	BC307	100	120	460	2.0	150	10	10	TO-92(97)	625
	BC337	BC327	1000	100	600	100				TO-92(97)	625
	BC547		100	110	800	2.0	300 Typ	10	10	TO-92(97)	625

\* TO-236AB is standard for all devices.

Please refer to Surface Mount section for TO-236 Device Marking.



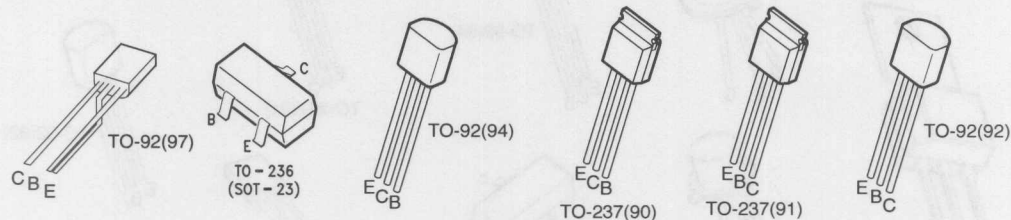


# General Purpose Amplifiers and Switches (continued)

$V_{CE0(sust)}$ (Volts) Min	Devices		$I_C$ (mA) Max	$h_{FE} @ I_C$			$f_T @ I_C$		NF (dB) Max	Package	$P_D (Amb)$ (mW) @25°C
	NPN	PNP		Min	Max	mA	(MHz) Min	mA			
45	BC550		100	200	800	2.0	300 Typ	10	3.0	TO-92(97)	625
	BC635	BC636	1000	40	250	150	130 Typ	100		TO-92(94)	625
	BC817	BC807	1000	100	600	100	200 Typ	100		TO-236*	350
	BC847		100	110		0.01	300 Typ	10	10	TO-236*	350
					800	2.0				TO-236*	
	BC850		100	200		0.01	300 Typ	10	3.0	TO-236*	350
					800	2.0				TO-236*	
	BCX19	BCX17	1000	100	600	100	100 Typ	50		TO-236*	350
	BCX59	BCX79	100	120	630	2.0	125	10	6.0	TO-92(97)	625
	BCX70		100	120	630	2.0	125	10	6.0	TO-236*	350
	BD371	BD370	1000	40	400	100	50	200		TO-237(91)	850
	BD373	BD372	1000	40	400	100	50	200		TO-237(90)	850
	MMBT100	MMBT200	500	100	450	10	250	20	4.0	TO-236*	350
	PN100	PN200	500	100	450	10	250	20	4.0	TO-92(92)	625
	PN100A	PN200A	500	300	600	10	250	20	4.0	TO-92(92)	625
	PN3642		500	40	120	150	150	50		TO-92(92)	625
	PN930		30	100	300	0.01	30	0.5		TO-92(92)	625
		BC557	100	75	260	2.0	300 Typ	10	10	TO-92(97)	625
		BC560	100	75	800	2.0	300 Typ	10	3.0	TO-92(97)	625

\* TO-236AB is standard for all devices.  
Please refer to Surface Mount section for TO-236 Device Marking.

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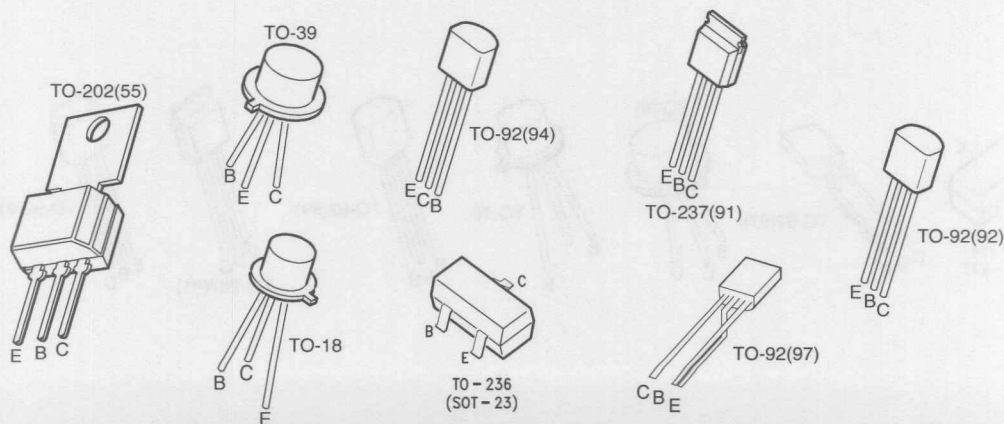


# General Purpose Amplifiers and Switches (continued)

$V_{CE0(sust)}$ (Volts) Min	Devices		$I_C$ (mA) Max	$h_{FE} @ I_C$			$f_T @ I_C$		NF (dB) Max	Package	$P_D (Amb)$ (mW) @25°C
	NPN	PNP		Min	Max	mA	(MHz) Min	mA			
45		BC857	100	125	800	2.0	300 Typ	10	10	TO-236*	350
		BC860	100	125	800	2.0	300 Typ	10	3.0	TO-236*	350
		BCX71	100	120	630	2.0	125 Typ	20	6.0	TO-236*	350
	BCX59	BCX79	100	120	630	2.0	125	10	6.0	TO-92(97)	625
		D41D4	1500	50	150	100	150	20		TO-202(55)	1333
		D41D5	1500	120	360	100	150	20		TO-202(55)	1333
		PN3644	500	100	300	150	200	20		TO-92(92)	625
40	2N2219A		500	100	300	150	300	20		TO-39	800
	2N2222A		500	100	300	150	300	20		TO-18	400
	2N3053		700	50	250	150	100	50		TO-39	800
	2N3903		200	50	150	10	250	10	6.0	TO-92(92)	625
	2N3904		200	100	300	10	300	10	5.0	TO-92(92)	625
	2N4400		600	50	150	150	200	20		TO-92(92)	625
	2N4401		600	100	300	150	250	20		TO-92(92)	625
	2N6715	2N6727	1000	50	250	1000	50	50		TO-237(91)	850
	2N697		200	40	120	150				TO-39	600
	MMBT2222A		500	100	300	150	300	20		TO-236*	350
	MMBT3904		200	100	300	10	300	10	5.0	TO-236*	350
	MMBT4400		600	50	150	150	200	20		TO-236*	350
	MMBT4401		600	100	300	150	250	20		TO-236*	350
	MPS6531	MPS6534	600	90	270	100	250 Typ	20	2.0 Typ	TO-92(92)	625
	PN2222A		500	100	300	150	300	20	4.0	TO-92(92)	625

\* TO-236AB is standard for all devices.

Please refer to Surface Mount section for TO-236 Device Marking.



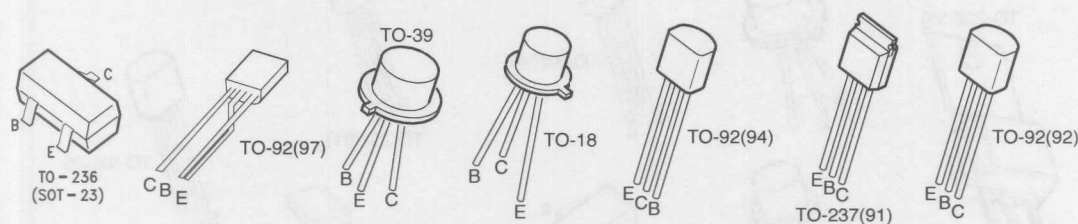
# General Purpose Amplifiers and Switches (continued)

$V_{CE0(sust)}$ (Volts) Min	Devices		$I_C$ (mA) Max	$h_{FE} @ I_C$			$f_T @ I_C$		NF (dB) Max	Package	$P_D (Amb)$ (mW) @25°C
	NPN	PNP		Min	Max	mA	(MHz) Min	mA			
40	PN3567		500	40	120	150	60	50		TO-92(92)	625
	PN3569		500	100	300	150	60	50		TO-92(92)	625
	TIS97		200	250	700	0.1	200	10		TO-92(97)	625
	TN2219A		500	100	300	150	300	20		TO-237(91)	850
		2N2904	600	40	120	150	200	50		TO-39	600
		2N2905	600	100	300	150	200	50		TO-39	600
		2N2907	600	100	300	150	200	50		TO-18	400
		2N3905	200	50	150	10	200	10	5.0	TO-92(92)	625
		2N3906	200	100	300	10	250	10	4.0	TO-92(92)	625
		2N4037	1000	50	250	150	60	50		TO-39	1000
		2N4402	600	50	150	150	150	20		TO-92(92)	625
		2N4403	600	100	300	150	200	20		TO-92(92)	625
		2N5366	500	100	300	50	300	20		TO-92(94)	360
		MMBT2907	600	100	300	150	200	50		TO-236*	350
		MMBT3906	200	100	300	10	250	10	4.0	TO-236*	350
		MMBT4402	600	50	150	150	150	20		TO-236*	350
		MMBT4403	600	100	300	150	200	20		TO-236*	350
		PN4121	100	70	200	10	400	10	4.0	TO-92(92)	625
		PN4122	100	150	600	10	450	10	4.0	TO-92(92)	625
		PN4250	100	250	700	0.1	40	0.5	2.0	TO-92(92)	625
		TIS93	400	100	300	50				TO-92(97)	625
		TN2905	600	100	300	150	200	50		TO-237(91)	850

\* TO-236AB is standard for all devices.

Please refer to Surface Mount section for TO-236 Device Marking.

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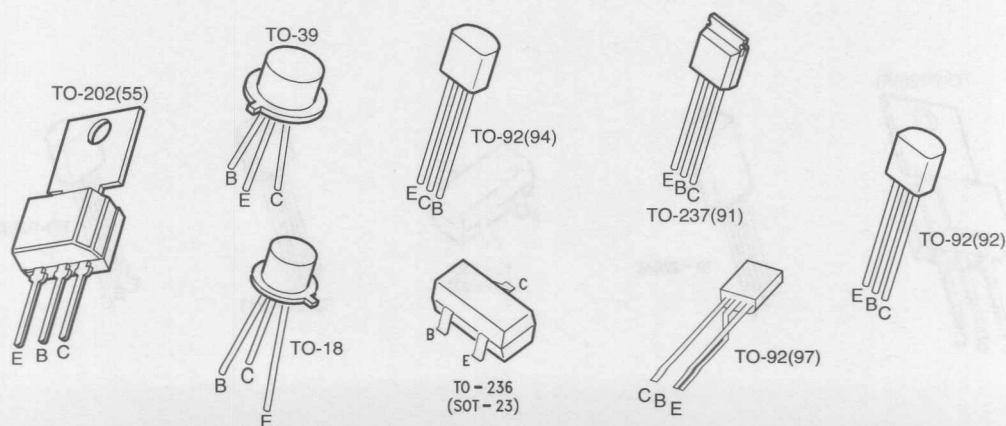


# General Purpose Amplifiers and Switches (continued)

$V_{CE0(sust)}$ (Volts) Min	Devices		$I_C$ (mA) Max	$h_{FE} @ I_C$			$f_T @ I_C$		NF (dB) Max	Package	$P_D (Amb)$ (mW) @25°C
	NPN	PNP		Min	Max	mA	(MHz) Min	mA			
32	BCW33		100	420	800	2.0	300 Typ	10	3.0	TO-236*	350
	BCX58		100	120	630	2.0	125	10	6.0	TO-92(97)	625
		BCX78	100	120	630	2.0	200	10	6.0	TO-92(97)	625
30	2N2222		500	100	300	150	250	20		TO-18	400
	2N3300		500	100	300	150	250	50		TO-39	800
	2N3302		500	100	300	150	250	50		TO-18	360
	2N3704		500	100	300	50	100	50		TO-92(94)	625
	2N4123		200	50	150	2.0	250	10	6.0	TO-92(92)	625
	2N6714	2N6726	1000	50	250	1000	50	50		TO-237(91)	850
	BC183		100	125	900	2.0	150	10	10	TO-92(97)	625
	BC184		100	240	900	2.0	150	4.0	10	TO-92(97)	625
	BC548		100	110	800	2.0	300 Typ	10	10	TO-92(97)	625
	BC549		100	200	800	2.0	300 Typ	10	4.0	TO-92(97)	625
	BC848		100	110		0.01	300 Typ	10	10	TO-236*	350
					800	2.0				TO-236*	
	BC849		100	200		0.01	300 Typ	10	4.0	TO-236*	350
					800	2.0				TO-236*	
	D40D1		1000	50	150	100	200 Typ	20		TO-202(55)	1333
	D40D2		1000	120	360	100	200 Typ	20		TO-202(55)	1333
	MMBT2222		500	100	300	150	250	20		TO-236*	350
	MMBT4123		200	50	150	2.0	250	10	6.0	TO-236*	350

\* TO-236AB is standard for all devices.

Please refer to Surface Mount section for TO-236 Device Marking.

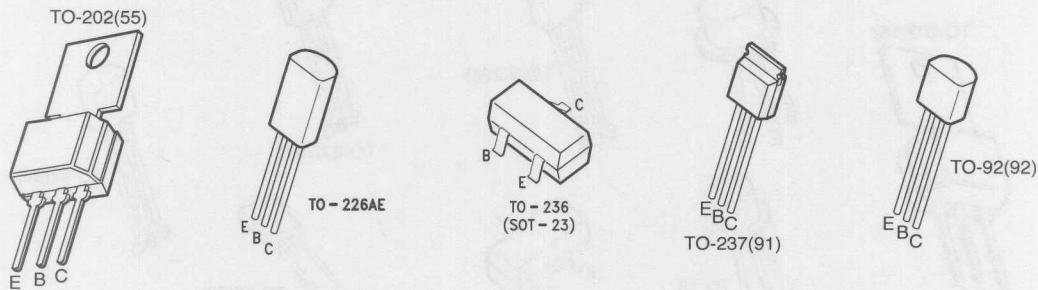




General Purpose Amplifiers and Switches (continued)

$V_{CE0(sust)}$ (Volts) Min	Devices		$I_C$ (mA) Max	$h_{FE} @ I_C$			$f_T @ I_C$		NF (dB) Max	Package	$P_D (Amb)$ (mW) @25°C
	NPN	PNP		Min	Max	mA	(MHz) Min	mA			
30	MPSW01A	MPSW51A	1000	50		1000	50	50		TO-226	1000
	NSDU01		1000	60		100	50	50		TO-202(55)	1333
	PN2222		500	100	300	150	250	20		TO-92(92)	625
	PN3566		200	150	600	10	40	30		TO-92(92)	625
	PN3643		500	100	300	150	250	50		TO-92(92)	625
	PN4141		500	100	300	150	250	20		TO-92(92)	625
	TN2219		500	100	300	150	250	20		TO-237(91)	850
		2N4125	200	50	150	2.0	200	10	5.0	TO-92(92)	625
		BC213	100	80	600	2.0	200	10	10	TO-92(97)	625
		BC214	100	140	600	2.0	200	10	2.0	TO-92(97)	625
		BC558	100	75	800	2.0	300 Typ	10	10	TO-92(97)	625
		BC559	100	75	800	2.0	300 Typ	10	4.0	TO-92(97)	625
		BC858	100	125	800	2.0	300 Typ	10	10	TO-236*	350
		BC859	100	125	800	2.0	300 Typ	10	4.0	TO-236*	350
		MMBT4125	200	50	150	2.0	200	10	5.0	TO-236*	350
		PN2907	500	100	300	150	200	20		TO-92(92)	625
		PN4143	500	100	300	150	200	20		TO-92(92)	625
		PN4917	100	150	300	10	450	10	4	TO-92(92)	625
		PN5138	50	50	800	0.1	30	0.5		TO-92(92)	625
* TO-236AB is standard for all devices. Please refer to Surface Mount section for TO-236 Device Marking.											

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# General Purpose Amplifiers and Switches (continued)

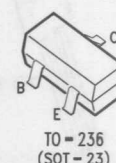
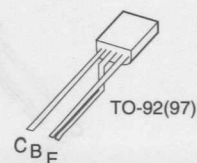
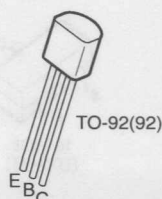
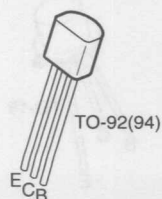
## Bipolar Transistors

$V_{CE0(sust)}$ (Volts) Min	Devices		$I_C$ (mA) Max	$h_{FE} @ I_C$			$f_T @ I_C$		NF (dB) Max	Package	$P_D (Amb)$ (mW) @25°C
	NPN	PNP		Min	Max	mA	(MHz) Min	mA			
25	2N3391A		100	250	500	2.0	120 Typ.	2.0	5.0	TO-92(94)	360
	2N3392		100	150	300	2.0	120 Typ.	2.0		TO-92(94)	360
	2N3393		100	90	180	2.0	120 Typ.	2.0		TO-92(94)	360
	2N3415		500	180	540	2.0				TO-92(94)	360
	2N4124		200	120	360	2.0	300	10	5.0	TO-92(92)	625
	2N5172		100	100	500	10	120	5.0		TO-92(94)	360
	BC238	BC308	100	125	900	2.0	150	10	10	TO-92(97)	625
	BC338	BC328	1000	100	600	100				TO-92(94)	625
	BC818	BC808	1000	100	600	100	150 Typ.	100		TO-236*	350
		BCX18	1000	100	600	100	200 Typ.	50		TO-236*	350
	BCX20		1000	100	600	100	130 Typ.	50		TO-236*	350
	MMBT4124		200	120	360	2.0	300	10	5.0	TO-236*	350
	MPS6514		100	150	300	2.0	450 Typ.	10	2.0 Typ.	TO-92(92)	625
	MPS6515	MPS6518	100	250	500	2.0	450 Typ.	10	2.0 Typ.	TO-92(92)	625
	MPS6521	MPS6523	100	200	600	2.0	450 Typ.	10	2.0 Typ.	TO-92(92)	625
	PN3565		50	150	600	1.0	40	1.0		TO-92(92)	625
		2N3702	200	60	300	50	100	50		TO-92(94)	625
		2N4126	200	120	360	2.0	250	10	4.0	TO-92(92)	625
		MMBT4126	200	120	360	2.0	250	10	4.0	TO-236*	350
		MPS6562	500	50	200	500	60	10		TO-92(92)	625
		PN3638	500	30		50	100	50		TO-92(92)	625
		PN3638A	500	100		50	150	50		TO-92(92)	625
20	BC239	BC309	100	180	800	2.0	150	10	10	TO-92(94)	625
	BC368	BC369	1000	85	375	500				TO-92(97)	625

\* TO-236AB is standard for all devices.

Please refer to Surface Mount section for TO-236 Device Marking.

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# Low Noise Amplifiers

$V_{CEQ(sust)}$ (Volts) Min	Device		$h_{FE} @ I_C$			NF (dB) Max	$f_T$ (MHz) Min	Package	Notes
	NPN	PNP	Min	Max	mA				
65	BC546		110	450	2	10	300 Typ	TO-92(97)	1,2C
	BC846		110		0.01	10	300 Typ	TO-236*	1,2C
				450	2				
		BC556	75	475	2	10	300 Typ	TO-92(97)	1,2C
60		BC856	125	475	2	10	300 Typ	TO-236*	1,2C
	2N2484		100	500	0.01	3	60	TO-18	2F
	2N3117		250	500	0.01	1	60	TO-18	2L
	2N5961		150	700	10	3	60	TO-92(92)	2M
		2N3962	100	300	0.01	3	50	TO-18	2N
		PN4249	100	300	0.1	3	6	TO-92(92)	2A
		PN4250A	250	700	0.1	2	6	TO-92(92)	2A
50	2N5210		200	600	0.1	3	30	TO-92(92)	2J
	BC182		125	500	2	10	150	TO-92(97)	1,2C
		2N5086	150	500	0.1	3	40	TO-92(92)	2H
		2N5087	250	800	0.1	2	40	TO-92(92)	2H
		BC212	60	400	2	10	200	TO-92(97)	1,2C
		MMBT5086	150	500	0.1	3	40	TO-236*	2H
		MMBT5087	250	800	0.1	2	40	TO-236*	2H
45	2N5962		600	1400	10	3	60	TO-92(92)	2M
	2N930		100	300	0.01	3	30	TO-18	2F
	BC237		125	500	2	10	150	TO-92(97)	1,2C
	BC547		110	800	2	10	300 Typ	TO-92(97)	1,2C
	BC550		200	800	2	3	300 Typ	TO-92(97)	1,2D
	BC847		110		0.01	10	300 Typ	TO-236*	1,2C
				800	2				

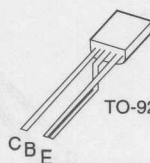
\* TO-236AB is standard for all devices.

Please refer to Surface Mount section for TO-236 Device Marking.

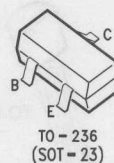
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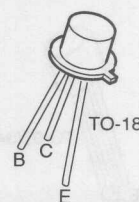
TO-92(92)



TO-92(97)



TO-236  
(SOT-23)

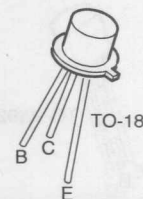
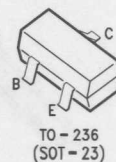
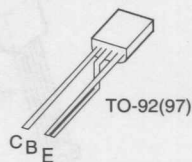
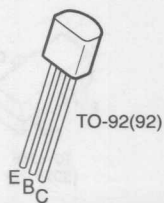


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# Low Noise Amplifiers (continued)

$V_{CE0(sust)}$ (Volts) Min	Device		$h_{FE} @ I_C$			NF (dB) Max	$f_T$ (MHz) Min	Package	Notes
	NPN	PNP	Min	Max	mA				
45	BC850		110		0.01	4	300 Typ	TO-236*	1,2C
				800	2	3			1,2D
	BCX59	BCX79	120	630	2	6	125	TO-92(97)	1,2C
	MMBT100	MMBT200	100	450	10	4	250	TO-236*	2B
	MPSA18		500	1500	10	1.5	100	TO-92(92)	2E
	PN100	PN200	100	450	10	4	250	TO-92(92)	2B
	PN100A	PN200A	300	600	10	4	250	TO-92(92)	2B
	PN930		100	300	0.01	3	30	TO-92(92)	2F
		BC307	125	500	2	10	300 Typ	TO-92(97)	1,2C
		BC557	75	260	2	10	300 Typ	TO-92(97)	1,2C
		BC560	75	800	2	3	300 Typ	TO-92(97)	1,2D
		BC857	125	800	2	10	300 Typ	TO-236*	1,2C
		BC860	125	800	2	4	300 Typ	TO-236*	1,2C
		BCX71	120	630	2	6	125	TO-236*	1,2C
40	2N3904		100	300	10	5	300	TO-92(92)	2G
	MMBT2222A		100	300	150	4	300	TO-236*	2B
	MMBT3904		100	300	10	5	300	TO-236*	2G
	PN2222A		100	300	150	4	300	TO-92(92)	2B
	TIS97		250	700	0.1	2	200	TO-92(97)	2E
		2N3906	100	300	10	4	250	TO-92(92)	2G
		MMBT3906	100	300	10	4	250	TO-236*	2G
		PN4250	250	700	0.1	2	50	TO-92(92)	2A
32	BCW33		420	800	2	10	300 Typ	TO-236*	2C
	BCX58	BCX78	120	630	2	6	125	TO-92(97)	1,2C
30	2N4123		50	150	2	6	250	TO-92(92)	2G
	2N5088		300	900	0.1	3	50	TO-92(92)	2E
	BC183		125	900	2	10	150	TO-92(97)	1,2C

\* TO-236AB is standard for all devices.  
Please refer to Surface Mount section for TO-236 Device Marking.

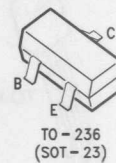
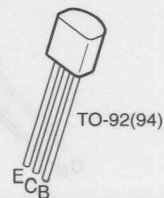
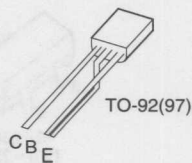
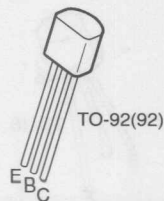


# Low Noise Amplifiers (continued)

$V_{CE0(sust)}$ (Volts) Min	Device		$h_{FE} @ I_C$			NF (dB) Max	$f_T$ (MHz) Min	Package	Notes
	NPN	PNP	Min	Max	mA				
30	BC184		240	900	2	4	150	TO-92(97)	1,2D
	BC548		110	800	2	10	300 Typ	TO-92(97)	1,2C,2D
	BC549		200	800	2	4	300 Typ	TO-92(97)	1,2C
	BC848		110		0.01	10	300 Typ	TO-236*	1,2C
				800	2				
	BC849		110		0.01	4	300 Typ	TO-236*	1,2C,2D
				800	2				
	MMBT5088		300	900	0.1	3	50	TO-236*	2E
		2N4125	50	150	2	5	250	TO-92(92)	2G
		BC213	80	600	2	10	200	TO-92(97)	1,2C
		BC214	140	600	2	2	200	TO-92(97)	1,2D
		BC558	75	800	2	10	300 Typ	TO-92(97)	1,2C
		BC559	75	800	2	4	300 Typ	TO-92(97)	1,2C
		BC858	125	800	2	10	300 Typ	TO-236*	1,2C
		BC859	125	800	2	4	300 Typ	TO-236*	1,2C,2D
25	2N3391A		250	500	2	5	300 Typ	TO-92(94)	2K
	2N4124		120	360	2	5	350	TO-92(92)	2G
	2N5089		400	1200	0.1	2	50	TO-92(92)	2E
	BC238		125	900	2	10	150	TO-92(97)	1,2C
	MMBT5089		400	1200	0.1	2	50	TO-236*	2E
	MPS6521	MPS6523	300	600	2	3	300 Typ	TO-92(92)	2F
		2N4126	120	360	2	4	250	TO-92(92)	2G
		BC308	125	900	2	10	300 Typ	TO-92(97)	1,2C

\* TO-236AB is standard for all devices.  
Please refer to Surface Mount section for TO-236 Device Marking.

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Low Noise Amplifiers (continued)

V <sub>CE0(sust)</sub> (Volts) Min	Device		h <sub>FE</sub> @ I <sub>C</sub>			NF (dB) Max	f <sub>T</sub> (MHz) Min	Package	Notes
	NPN	PNP	Min	Max	mA				
20	BC239		240	900	2	4	150	TO-92(97)	1,2C,2D
		BC309	125	900	2	4	300 Typ	TO-92(97)	1,2C,2D

1 Suffixes: Many suffix devices, such as B, C, -9, G, etc. are available, subject to minimum order criteria.

2A — NF: Noise Figure @ R<sub>S</sub> = 1 kΩ, I<sub>C</sub> = 20 μA to 250μA,  
f = 1 kHz; @ R = 10 kΩ, I<sub>C</sub> = 20 μA, f = 10 Hz to 15 kHz

2B — NF: Noise Figure @ R<sub>S</sub> = 2 kΩ, I<sub>C</sub> = 100 μA, f = 1 kHz

2C — NF: Noise Figure @ R<sub>S</sub> = 2 kΩ, I<sub>C</sub> = 200 μA, f = 1 kHz

2D — NF: Noise Figure @ R<sub>S</sub> = 2 kΩ, I<sub>C</sub> = 200 μA, f = 3 Hz to 15kHz

2E — NF: Noise Figure @ R<sub>S</sub> = 10 kΩ, I<sub>C</sub> = 100 μA, f = 10 Hz to 15kHz

2F — NF: Noise Figure @ R<sub>S</sub> = 10 kΩ, I<sub>C</sub> = 10 μA, f = 10 Hz to 15kHz

2G — NF: Noise Figure @ R<sub>S</sub> = 1 kΩ, I<sub>C</sub> = 100 μA, f = 10 Hz to 15kHz

2H — NF: Noise Figure @ R<sub>S</sub> = 1 kΩ, I<sub>C</sub> = 100 μA, f = 1 kHz  
@ R<sub>S</sub> = 10 kΩ, I<sub>C</sub> = 20 mA, f = 10 Hz to 15 kHz

2J - NF: Noise Figure @ R<sub>S</sub> = 10 kΩ, I<sub>C</sub> = 20 μA, f = 1 kHz  
@ R<sub>S</sub> = 22 kΩ, I<sub>C</sub> = 20 μA, f = 10 Hz to 15 kHz

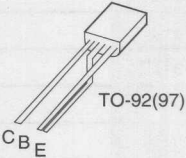
2K — NF: Noise Figure @ R<sub>S</sub> = 10 kΩ, I<sub>C</sub> = 500 μA, f = 10 Hz to 15kHz

2L — NF: Noise Figure @ R<sub>S</sub> = 50 kΩ, I<sub>C</sub> = 5.0 μA, f = 1.0 KHz and 10 KHz

2M — NF: Noise Figure @ R<sub>S</sub> = 10 kΩ, I<sub>C</sub> = 10 μA, f = 1.0 KHz

2N — NF: Noise Figure @ R<sub>S</sub> = 1 kΩ, I<sub>C</sub> = 20 μA

\* TO-236AB is standard for all devices.  
Please refer to Surface Mount section for TO-236 Device Marking.





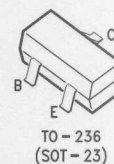
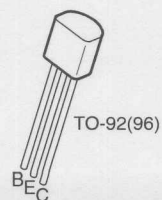
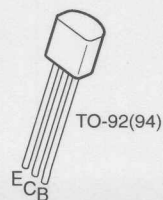
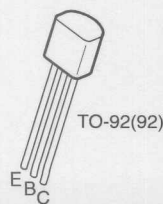
# RF Amplifiers

Devices		$V_{CEO(Sust)}$ (Volts) Min	$I_C$ (mA) Max	$h_{FE} @ I_C V_{CE}$			$f_T$ (MHz) Min	$C_{ob}$ pF Max	NF (dB) @ f		Package
NPN	PNP			Min	mA	V			Max	MHz	
2N3663		12	50	20	8.0	10	700	1.70	6.5	60	TO-92(94)
2N5179		12	50	25	3.0	1.0	900	1.0	4.5	200	TO-72
MMBT5179		12	50	25	3.0	1.0	900	1.0	4.5	200	TO-236*
MPS5179		12	50	25	3.0	1.0	900	1.0	4.5	200	TO-92(92)
2N5770		15	50	20	3.0	1.0	900	1.1	6.0	60	TO-92(92)
2N918		15	50	20	3.0	1.0	600	1.7	6.0	60	TO-72
MMBT918		15	50	20	3.0	1.0	600	1.7	6.0	60	TO-236*
PN918		15	50	20	3.0	1.0	600	1.7	6.0	60	TO-92(92)
BF199		25	100	40	7.0	10	750 Typ.	0.35 Typ.	2.5 .Typ.	35	TO-92(98)
MMBTH10		25	50	60	4.0	10	650	0.7			TO-236*
MPSH10		25	50	60	4.0	10	650	0.7			TO-92(96)
MMBTH11		25	50	60	4.0	10	660	0.9			TO-236*
MPSH11		25	50	60	4.0	10	660	0.9			TO-92(96)
MMBTH24		30	100	30	8.0	10	400	0.36			TO-236*
MPSH24		30	100	30	8.0	10	400	0.36			TO-92(96)
MMBTH34		45	100	40	7.0	15	500	0.32			TO-236*
MPSH34		45	100	40	7.0	15	500	0.32			TO-92(96)
PN3563		12	50	20	8.0	10	600	1.7	6 Typ.	60	TO-92(92)
	MMBTH81	20	50	60	5.0	10	600	0.85			TO-236*
	MPSH81	20	50	60	5.0	10	600	0.85			TO-92(96)

\* TO-236AB is standard for all devices.

Please refer to Surface Mount section for TO-236 Device Marking.

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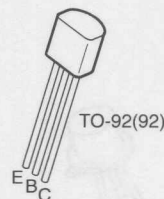
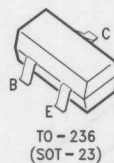
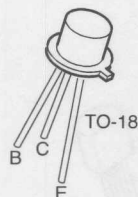
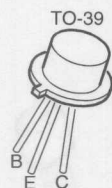


# High Speed Saturated Switching Transistors

$V_{CE(sust)}$ (Volts) Min	Devices		$t_{on}$ (ns) Max	$t_{off} @ I_C$		$h_{FE} @ I_C$		$V_{CE(sat)} @ I_C \& I_B$			$f_T$ (MHz) Min	Package	$P_D (Amb)$ (mW) @25°C
	NPN	PNP		(ns) Max	mA	Min	mA	(Volts) Max	mA	mA			
60		2N2904A	45	100	150	40	150	0.4	150	15	200	TO-39	600
		2N2905A	45	100	150	100	150	0.4	150	15	200	TO-39	600
		2N2907A	45	100	150	100	150	0.4	150	15	200	TO-18	400
		MMBT2907A	45	100	150	100	150	0.4	150	15	200	TO-236*	350
		PN2907A	45	100	150	100	150	0.4	150	15	200	TO-92(92)	625
		PN3645	40	100	300	100	150	0.25	50	2.5	200	TO-92(92)	625
		TN2905A	45	100	150	100	150	0.4	150	15	200	TO-237(91)	850
50	2N3725		35	60	500	60	100	0.95	1A	100	300	TO-39	800
	TN3725		35	60	500	60	100	0.95	1A	100	300	TO-237(91)	850
45		PN3644	40	100	300	100	150	0.25	50	2.5	200	TO-92(92)	625
40	2N2219A		35	285	150	100	150	0.3	150	15	300	TO-39	800
	2N2222A		35	285	150	100	150	0.3	150	15	300	TO-18	400
	2N3903		70	225	10	50	10	0.2	10	1.0	250	TO-92(92)	625
	2N3904		70	250	10	100	10	0.2	10	1.0	300	TO-92(92)	625
	2N4400		35	255	150	50	150	0.4	150	15	200	TO-92(92)	625
	2N4401		35	255	150	100	300	0.4	150	15	250	TO-92(92)	625
	BSR17A		70	250	10	100	10	0.2	10	1.0	300	TO-236*	350
	MMBT2222A		35	285	150	100	150	0.3	150	15	300	TO-236*	350
	MMBT3904		70	250	10	100	10	0.2	10	1.0	300	TO-236*	350
	MMBT4401		35	255	150	100	300	0.4	150	15	250	TO-236*	350
	PN2222A		35	285	150	100	150	0.3	150	15	300	TO-92(92)	625

\* TO-236AB is standard for all devices.

Please refer to Surface Mount section for TO-236 Device Marking.

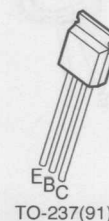
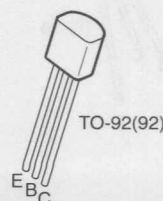
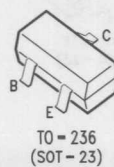
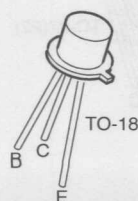


# High Speed Saturated Switching Transistors (continued)

$V_{CE0(sust)}$ (Volts) Min	Devices		$t_{on}$ (ns) Max	$t_{off}$ @ $I_C$		$h_{FE}$ @ $I_C$		$V_{CE(sat)}$ @ $I_C$ & $I_B$			$f_T$ (MHz) Min	Package	$P_D$ (Amb) (mW) @25°C
	NPN	PNP		(ns) Max	mA	Min	mA	(Volts) Max	mA	mA			
40	TN2219A		35	285	150	100	150	0.3	150	15	300	TO-237(91)	850
		2N3467	40	90	500	40	500	0.5	500	50	175	TO-39	1000
		2N3905	70	260	10	50	10	0.25	10	1.0	200	TO-92(92)	625
		2N3906	70	300	10	100	10	0.25	10	1.0	250	TO-92(92)	625
		2N4402	35	255	150	50	150	0.4	150	15	150	TO-92(92)	625
		2N4403	35	255	150	100	150	0.4	150	15	200	TO-92(92)	625
		MMBT3906	70	300	10	100	10	0.25	10	1.0	250	TO-236*	350
		MMBT4403	35	255	150	100	150	0.4	150	15	200	TO-236*	350
		PN2907	45	100	150	100	150	0.4	150	15	200	TO-92(92)	625
		PN4121	40	150	50	70	10	0.3	50	5.0	400	TO-92(92)	625
		PN4122	40	150	50	150	10	0.3	50	5.0	450	TO-92(92)	625
		TN2905	45	100	150	100	150	0.4	150	15	200	TO-237(91)	850
30	2N3724		35	60	500	60	100	0.75	1A	100	300	TO-39	800
		PN4917	40	150	50	150	10	0.3	50	5.0	450	TO-92(92)	625
25		PN3638	75	170	300	30	50	0.25	50	2.5	100	TO-92(92)	625
		PN3638A	75	170	300	100	50	0.25	50	2.5	150	TO-92(92)	625
15	2N2369		12	18	10	40	10	0.25	10	1.0	500	TO-18	360
	2N2369A		12	18	10	40	10	0.2	10	1.0	500	TO-18	360
	2N708		40	70	10	30	10	0.4	10	1.0	300	TO-18	360
	MMBT2369A		12	18	10	40	10	0.2	10	1.0	500	TO-236*	350

\* TO-236AB is standard for all devices.  
Please refer to Surface Mount section for TO-236 Device Marking.

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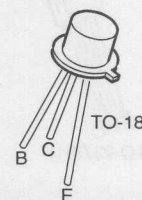
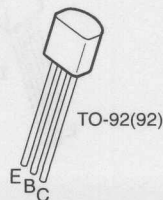
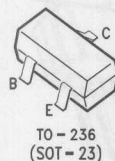


# High Speed Saturated Switching Transistors (continued)

## Bipolar Transistors

$V_{CE(sust)}$ (Volts) Min	Devices		$t_{on}$ (ns) Max	$t_{off} @ I_C$		$h_{FE} @ I_C$		$V_{CE(sat)} @ I_C \text{ \& } I_B$			$f_T$ (MHz) Min	Package	$P_D (Amb)$ (mW) @25°C
	NPN	PNP		(ns) Max	mA	Min	mA	(Volts) Max	mA	mA			
15	MMBT3646		18	28	300	30	30	0.2	30	3.0	350	TO-236*	350
	PN2369		12	18	10	40	10	0.25	10	1.0	500	TO-92(92)	625
	PN2369A		12	18	10	40	10	0.2	10	1.0	500	TO-92(92)	625
	PN3646		18	28	300	30	30	0.2	30	3.0	350	TO-92(92)	625
	PN4275		12	12	10	35	10	0.2	10	1.0	400	TO-92(92)	625
		2N4209	15	20	10	50	10	0.18	10	1.0	850	TO-18	300
		2N5771	15	20	10	50	10	0.18	10	1.0	850	TO-92(92)	625
		MMBT4209	15	20	10	50	10	0.18	10	1.0	850	TO-236*	350
		MMBT5771	15	20	10	50	10	0.18	10	1.0	850	TO-236*	350
12		2N4208	15	20	10	30	10	0.15	10	1.0	700	TO-18	300
		MMBT3640	25	35	50	30	10	0.2	10	1.0	500	TO-236*	350
		MMBT4258	15	20	10	30	50	0.15	10	1.0	700	TO-236*	350
		PN3640	25	35	50	30	10	0.2	10	1.0	500	TO-92(92)	625
		PN4258	15	20	10	30	50	0.15	10	1.0	700	TO-92(92)	625
		BSV52	12	18	10	40	10	0.25	10	1.0	500	TO-236*	350
10	PN5134		18	18	10	20	10	0.25	10	1.0	250	TO-92(92)	625

\* TO-236AB is standard for all devices.  
Please refer to Surface Mount section for TO-236 Device Marking.

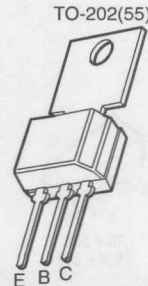
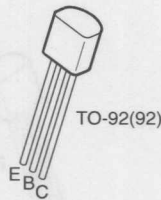
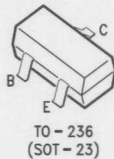
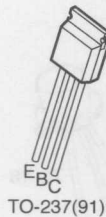




# High Voltage Amplifiers

$V_{CE0(sust)}$ (Volts) Min	Device		$I_C$ (mA) Max	$h_{FE} @ I_C$		$V_{CE(sat)} I_C \text{ \& } I_B$			$f_T$ (MHz) Min	Package	$P_D (Amb)$ (mW) @25°C
	NPN	PNP		Min	(mA)	(Volts) Min	(mA)	(mA)			
300	2N6719		500	40	30				30	TO-237(91)	850
	MMBTA42		500	40	30	0.5	20	2.0	50	TO-236*	350
	MPSA42		500	40	30	0.5	20	2.0	50	TO-92(92)	625
		MMBTA92	500	25	30	0.5	20	2.0	50	TO-236*	350
		MPSA92	500	25	30	0.5	20	2.0	50	TO-92(92)	625
250	D40N2		500	60	20				50	TO-202(55)	2000
200	MPSA43		500	40	30	0.5	20	2.0	50	TO-92(92)	625
160	2N5551		600	80	10	0.2	50	5.0	100	TO-92(92)	350
	MMBT5551		600	80	10	0.2	50	5.0	100	TO-236*	350
150		2N5401	600	60	10	0.5	50	5.0	100	TO-92(92)	625
		MMBT5401	600	60	10	0.5	50	5.0	100	TO-236*	350
140	2N5550		600	60	10	0.25	50	5.0	100	TO-92(92)	350
	MMBT5550		600	60	10	0.25	50	5.0	100	TO-236*	350
120		2N5400	600	40	10	0.5	50	5.0	100	TO-92(92)	625
100		MPSL51	600	40	50	0.3	50	5.0	60	TO-92(92)	625
		2N5830	200	80	10	0.25	50	5	100	TO-92(92)	625

\* TO-236AB is standard for all devices.  
Please refer to Surface Mount section for TO-236 Device Marking.



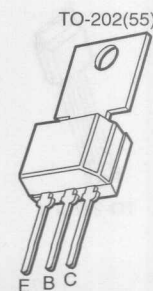
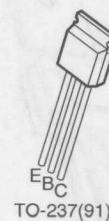
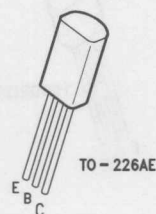
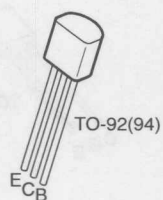
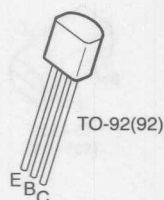


# Darlington Transistors

## Bipolar Transistors

V <sub>CE(sust)</sub> (Volts) Min	Devices		I <sub>C</sub> Max (Amps)	h <sub>FE</sub> @ I <sub>C</sub>			V <sub>CE(sat)</sub> @ I <sub>C</sub> & I <sub>B</sub>			f <sub>T</sub> (MHz) Min	Package	P <sub>D (Amb)</sub> (Watts) @25°C	
	NPN	PNP		Min	Max	mA	(Volts) Max	mA	μA				
100	2N7051		1	20,000		100	1.4	200	200	200	TO-92(94)	0.6	
				1,000	20,000	1A							
	2N7053		1	20,000		100	1.5	200	0.2	200	TO-226	1	
				1,000	20,000	1A							
50	2N6725		1	25,000		200	1.0	200	2mA	100	TO-237(91)	0.85	
				15,000		500	1.5	1A	2mA	100		0.85	
				4,000	40,000	1A							
	D40C7		1	10,000	60,000	200	1.5	500	500		TO-202(55)	1.3	
	D40K2		1	10,000		200	1.5	1.5A	3mA		TO-202(55)	1.3	
				1,000		1.5A							
	D40K4		1	10,000		200	1.5	1A	2mA		TO-202(55)	1.3	
				1,000		1.5A							
40	2N5307		0.3	2,000	20,000	2	1.4	200	200	60	TO-92(94)	0.4	
				6,000		100							
	2N5308		0.3	7,000	70,000	2	1.4	200	200	60	TO-92(94)	0.4	
				20,000		100							
	2N6427		1	10,000	100,000	10	1.2	50	500	130	TO-92(92)	0.625	
				20,000	200,000	100	1.5	500	500				
				14,000	140,000	500							
	2N6548		2	25,000	150,000	200	1.5	1A	2mA		TO-202(55)	1.3	
				15,000		500	2.0	2A	4mA				
				5,000		1A							
	2N6549		2	15,000	150,000	200	1.5	1A	2mA		TO-202(55)	1.3	
				10,000		500	2	2A	4mA				
				3,000		1A							

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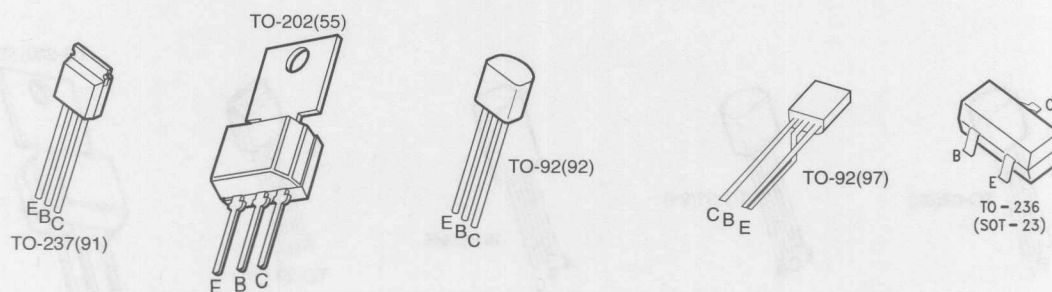
# Darlington Transistors (continued)

$V_{CE0(sust)}$ (Volts) Min	Devices		$I_C$ Max (Amps)	$h_{FE} @ I_C$			$V_{CE(sat)} @ I_C \& I_B$			$f_T$ (MHz) Min	Package	$P_D (Amb)$ (Watts) @25°C
	NPN	PNP		Min	Max	mA	(Volts) Max	mA	$\mu A$			
40	2N6724		1	25,000		200	1.0	200	2mA	100	TO-237(91)	0.85
				15,000		500	1.5	1A				
				4,000	40,000	1A						
	D40C4		1	10,000	60,000	200	1.5	500	500		TO-202(55)	1.3
	D40C5		1	40,000		200	1.5	500	500		TO-202(55)	1.3
	NSD154		1	20,000		10	1.5	100	100		TO-202(55)	1.3
				5,000		100						
	NSDU45		1	25,000	150,000	200	1.0	200	2mA	100	TO-202(55)	1.3
				15,000		500	1.5	1A	2mA			
				4,000		1A						
30	BC517	BC516	1	30,000		20	1.0	100	100		TO-92(97)	0.6
	BCV27	BCV26	1	4,000		1	1.0	100	100		TO-236*	0.35
				10,000		10						
				20,000		100						
	D40C1		1	10,000	60,000	200	1.5	500	500		TO-202(55)	1.3
	D40K1		1	10,000		200	1.5	1.5A	3mA		TO-202(55)	1.3
				1,000		1.5A						
	MMBTA13		1	5,000		10	1.5	100	100	125	TO-236*	0.35
				10,000		100						
	MMBTA14		1	10,000		10	1.5	100	100	125	TO-236*	0.35
				20,000		100						
	MPSA13	MPSA63	1	5,000		10	1.5	100	100	125	TO-92(92)	0.625
				10,000		100						

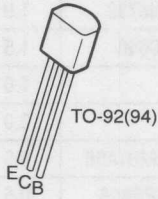
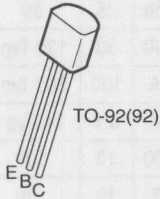
\* TO-236AB is standard for all devices.

Please refer to Surface Mount section for TO-236 Device Marking.

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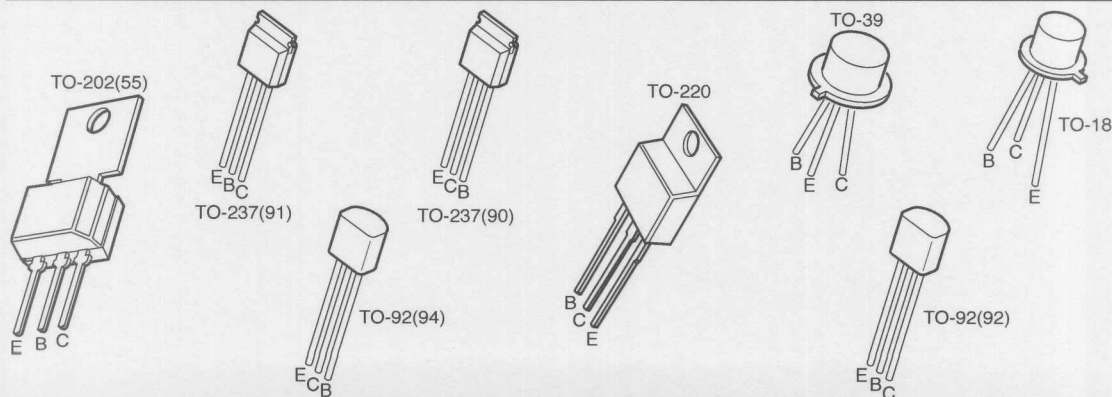


$V_{CE(sust)}$ (Volts) Min	Devices		$I_C$ Max (Amps)	$h_{FE} @ I_C$			$V_{CE(sat)} @ I_C \text{ \& } I_B$			$f_T$ (MHz) Min	Package	$P_D (Amb)$ (Watts) @25°C
	NPN	PNP		Min	Max	mA	(Volts) Max	mA	$\mu A$			
30	MPSA14		1	10,000		10	1.5	100	100	125	TO-92(92)	0.625
				20,000		100						
		MPSA65	1	50,000		10	1.5	100	100	100	TO-92(92)	0.625
				20,000		100						
25	2N5306		0.2	7,000	70,000	2	1.4	200	200	60	TO-92(94)	0.4
				20,000		100						
20	MPSA12		1	20,000		10	1.0	10	10		TO-92(92)	0.625



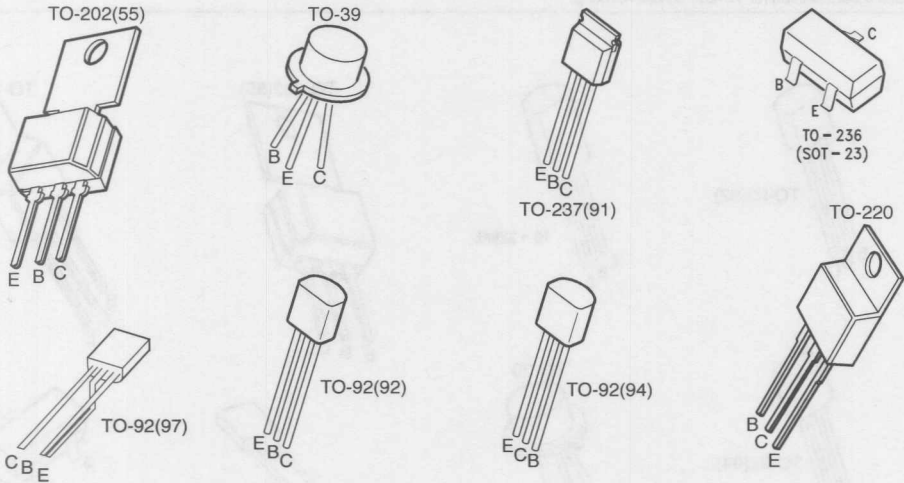
# High Current Drivers

$V_{CE(sust)}$ (Volts) Min	Devices		$I_C$ (Amps) Max	$h_{FE} @ I_C$			$V_{CE(sat)} @ I_C \& I_B$			$f_T$ (MHz) Min	Package	$P_D (Amb)$ (Watts) @25°C
	NPN	PNP		Min	Max	mA	(Volts) Max	mA	mA			
100	2N6553		1.0	80	250	50	1.0	1A	100	75	TO-202(55)	1.33
	2N6718	2N6730	1.0	50	250	250	0.35	250	25	50	TO-237(91)	0.85
	NSDU07		1.0	50		250	0.35	250	25	50	TO-202(55)	2.0
80	2N3019		1.0	100	300	150	0.5	500	50	100	TO-39	0.8
	2N3700		1.0	100	300	150	0.5	500	50	80	TO-18	0.5
	2N6707		1.0	40	250	250	1.0	1A	100	50	TO-237(90)	0.85
	2N6717	2N6729	1.0	50	250	250	0.35	250	25	50	TO-237(91)	0.85
	2N6731	2N6732	1.0	100	300	350	0.35	350	35	50	TO-237(91)	0.85
	BC639	BC640	1.5	40	250	150	0.50	500	50	130 Typ.	TO-92(94)	0.625
	D40E7		1.0	50		100	1.0	1A	100	200 Typ.	TO-202(55)	1.33
	D44C11		3.0	40	120	200	0.5	1A	0.1	50 Typ.	TO-220	1.67
	MMBTA06	MMBTA56	0.5	50		100	0.25	100	10	100	TO-236*	0.35
	MPSA06	MPSA56	0.5	50		100	0.25	100	10	100	TO-92(92)	0.625
	NSD105		1.5	120	360	100	0.5	500	50	60	TO-202(55)	2.0
	TN3019		1.0	100	300	150	0.5	500	50	100	TO-237(91)	0.85
		2N4033	1.0	100	300	100	1.0	1A	100	150	TO-39	0.8
		D45C11	4.0	40	120	200	0.5	1A	50	40 Typ.	TO-220	1.67
		PN4356	0.5	50	250	10	0.5	500	50	100	TO-92(92)	0.625
		2N6555	1.5	80	300	50	1.0	1A	100	75	TO-202(55)	1.33
		TN4033	1.0	100	300	100	0.5	500	50	150	TO-237(91)	0.85
		2N4036	1.0	40	140	150	0.65	150	15	60	TO-39	1.0
		TN4036	1.0	40	140	150	0.65	150	15	60	TO-237	0.85
<p>* TO-236AB is standard for all devices. Please refer to Surface Mount section for TO-236 Device Marking.</p>												



$V_{CE0(sust)}$ (Volts) Min	Devices		$I_C$ (Amps) Max	$h_{FE} @ I_C$			$V_{CE(sat)} @ I_C \text{ \& } I_B$			$f_T$ (MHz) Min	Package	$P_D (Amb)$ (Watts) @25°C
	NPN	PNP		Min	Max	mA	(Volts) Max	mA	mA			
60	2N6551		1.0	80	300	50	1.0	1A	100	75	TO-202(55)	1.33
	2N6716	2N6728	1.0	50	250	250	0.35	250	25	50	TO-237(91)	0.85
	BC637	BC639	1.5	40	250	150	0.50	500	50	130 Typ.	TO-92(94)	0.625
	MMBTA05	MMBTA55	0.5	50		100	0.25	100	10	100	TO-236*	0.35
	MPS8098		0.5	100	300	1	0.3	100	10	150	TO-92(92)	0.625
	MPSA05	MPSA55	0.5	50		100	0.25	100	10	100	TO-92(92)	0.625
	NSDU05	NSDU55	1.5	50		250	0.35	250	25	50	TO-202(55)	1.33
		2N4032	1.0	100	300	100	0.5	500	50	150	TO-39	0.8
		2N6554	1.5	80	300	50	1.0	1A	100	75	TO-202(55)	1.33
		D43C8	3.0	40	120	200	0.5	1A	50	150 Typ.	TO-202(55)	1.33
		D45C8	4.0	40	120	200	0.5	1A	50	40 Typ.	TO-220	1.67
		D45H8	10.0	40		4A	1.0	8A	400	40 Typ.	TO-220	1.67
50	2N3725		1.0	60	150	100	0.95	1A	100	300	TO-39	0.8
	TN3725		1.0	60	150	100	0.75	1A	100	300	TO-237(91)	0.85
45	BC337	BC327	1.0	100	600	100	0.7	500	50	60 Typ.	TO-92(97)	0.625
	BC635	BC636	1.5	40	250	150	0.50	500	50	130 Typ.	TO-92(94)	0.625
	BC818	BC808	1.0	100	600	100	0.7	500	50	100 Typ.	TO-236*	0.3

\* TO-236AB is standard for all devices.  
Please refer to Surface Mount section for TO-236 Device Marking.





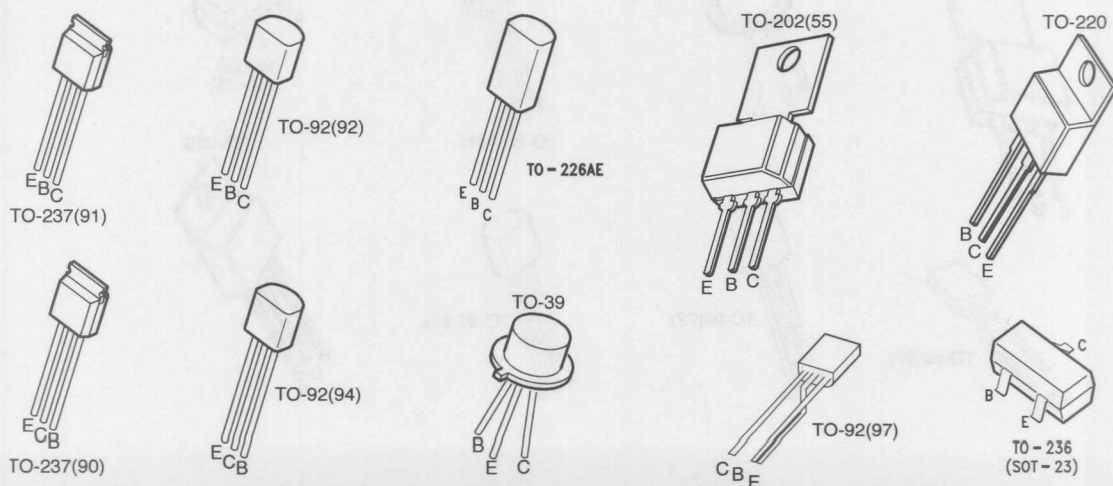
## High Current Drivers (continued)

$V_{CE(sust)}$ (Volts) Min	Devices		$I_C$ (Amps) Max	$h_{FE} @ I_C$			$V_{CE(sat)} @ I_C \& I_B$			$f_T$ (MHz) Min	Package	$P_D (Amb)$ (Watts) @25°C
	NPN	PNP		Min	Max	mA	(Volts) Max	mA	mA			
45	BCX19	BCX17	1.0	100	600	100	0.62	500	50	100 Typ.	TO-236*	0.3
	BD371	BD370	1.0	40	400	100	0.7	750	75	50	TO-237(91)	0.85
	BD373	BD372	1.0	40	400	100	0.7	1A	100	50	TO-237(90)	0.85
		D41D4	1.0	50	150	100	0.5	500	50	150 Typ.	TO-202(55)	1.33
		D41D5	1.0	120	360	100	0.5	500	50	40 Typ.	TO-202(55)	1.33
		D45H5	10.0	40		4A	1.0	8A	400	40 Typ.	TO-220	1.67
40	2N6715	2N6727	1.0	50	250	1A	0.5	1A	100	50	TO-237(91)	0.85
	MPSW01A		1.0	50		1A	0.5	1A	100	50	TO-226	1.0
	MPSW51A		1.0	50		1A	0.7	1A	100	50	TO-226	1.0
		2N3467	1.0	40	120	500	1.0	1A	100	175	TO-39	1.0
		2N4037	1.0	50	250	150	1.4	150	15	60	TO-39	1.0
30	NSDU01		1.5	50		1A	0.5	1A	100	50	TO-202(55)	2.0
	2N3724		1.0	60	150	100	0.75	1A	100	300	TO-39	0.8
	2N6714	2N6726	1.0	50	250	1A	0.5	1A	100	50	TO-237(91)	0.85
	D40D1		1.0	50	150	100	1.0	500	50	200 Typ.	TO-202(55)	1.33
	D40D2		1.0	120	360	100	1.0	500	50	200 Typ.	TO-202(55)	1.33
25	BC338	BC328	1.0	100	600	100	0.7	500	50	200 Typ.	TO-92(97)	0.625
	BC817	BC807	1.0	100	600	100	0.7	500	50	100 Typ.	TO-236*	0.3
	BCX20	BCX18	1.0	100	600	100	0.62	500	50	100 Typ.	TO-236*	0.3
20	BC368	BC369	2.0	85	375	500	0.5	1A	100	200 Typ.	TO-92(94)	1.0

\* TO-236AB is standard for all devices.

Please refer to Surface Mount section for TO-236 Device Marking.

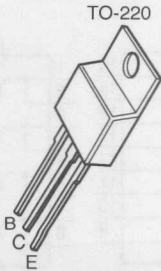
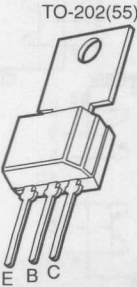
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# Planar Power Transistors

Bipolar Transistors

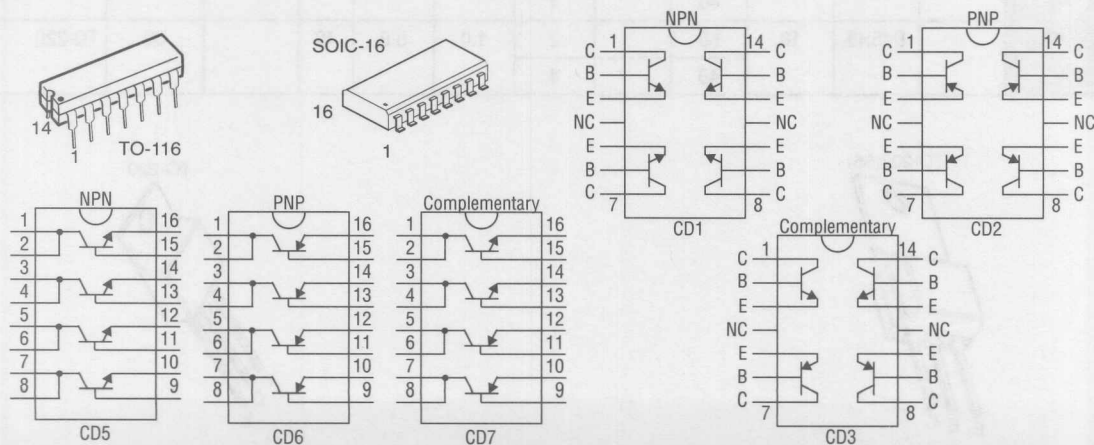
$V_{CE0(sust)}$ (Volts) Min	Device		$I_C$ Cont (Amps) Max	$h_{FE} @ I_C$			$V_{CE(sat)} @ I_C$		$f_T$ MHz Min	$P_D (Amb)$ (Watts) @25°C	$P_D (Case)$ (Watts) @25°C	Package
	NPN	PNP		Min	Max	(Amps)	(Volts) Max	(Amps)				
250	D40N2		0.1	60	180	0.02			75	2	10	TO-202(55)
30	D40C1		1	10,000	60,000	0.2	1.5	0.5		2	10	TO-202(55)
40	D40C4		1	10,000	60,000	0.2	1.5	0.5		2	10	TO-202(55)
40	D40C5		1	40,000		0.2	1.5	0.5		2	10	TO-202(55)
50	D40C7		1	10,000	60,000	0.2	1.5	0.5		2	10	TO-202(55)
80	D40E7		1	50		0.1	1.0	1.0		2	10	TO-202(55)
30	D40K1		1	10,000		0.2	1.5	1.0		2	10	TO-202(55)
50	D40K2		1	10,000		0.2	1.5	1.5		2	10	TO-202(55)
30	D40K4		1	10,000		0.2	1.5	1.0		2	10	TO-202(55)
30	D40D1		1.5	50	150	0.1	0.5	0.5		2	10	TO-202(55)
				10		1						
30	D40D2		1.5	120	360	0.1	0.5	0.5		2	10	TO-202(55)
				10		1						
45		D41D4	1.5	50	150	0.1	0.5	0.5		2	10	TO-202(55)
				10		1						
45		D41D5	1.5	120	360	0.1	0.5	0.5		2	10	TO-202(55)
				10		1						
60	D44C8	D45C8	3	40	120	0.2	0.5	1.0	32		30	TO-220
				20		1						
80	D44C11	D45C11	3	40	120	0.2	0.5	1.0	32		30	TO-220
				20		1						
45		D45H5	10	60		2	1.0	8.0	40		60	TO-220
				40		4						
60		D45H8	10	60		2	1.0	8.0	40		60	TO-220
				40		4						



# Multiple Bipolar Transistors—Quad

Device	Type	$V_{CE}$ (V) Min	$I_C$ (A) Max	$h_{FE} @ I_C$		$f_T$ MHz Min	$C_{OB}$ pF Max	$V_{CE(SAT)}$ Volts @ $I_C/I_B$ & $I_C$			Config- uration	Package
				Min	mA			Max		mA		
MMPQ6502	BOTH	30	0.5	100	150	200	8	0.4	10	150	CD7	SOIC-16
MPQ6502	BOTH	30	0.5	100	150	200	8	0.4	10	150	CD3	TO-116
MMPQ6700	BOTH	40	0.2	70	10	200	4.5	0.25	10	1	CD7	SOIC-16
MPQ6700	BOTH	40	0.2	70	10	200	4.5	0.25	10	1	CD3	TO-116
MMPQ2369	NPN	15	0.5	40	10	450	4	0.25	10	10	CD5	SOIC-16
MPQ2369	NPN	15	0.5	40	10	450	4	0.25	10	10	CD1	TO-116
MMPQ2222	NPN	30	0.5	100	150	200	8	0.4	10	150	CD5	SOIC-16
MPQ2222	NPN	30	0.5	100	150	200	8	0.4	10	150	CD1	TO-116
MMPQ3724	NPN	36	1	35	500	300	12	0.32	10	300	CD5	SOIC-16
MPQ3724	NPN	36	1	35	500	300	12	0.32	10	300	CD1	TO-116
MMPQ3725	NPN	40	1	25	500	250	10	0.45	10	500	CD5	SOIC-16
MPQ3725	NPN	40	1	25	500	250	10	0.45	10	500	CD1	TO-116
MMPQ3904	NPN	40	0.2	75	10	250	4	0.2	10	10	CD5	SOIC-16
MPQ3904	NPN	40	0.2	75	10	250	4	0.2	10	10	CD1	TO-116
MMPQ2222A	NPN	40	0.5	100	150	200	8	0.3	10	150	CD5	SOIC-16
MMPQ2907	PNP	40	0.6	100	150	200	8	0.4	10	150	CD6	SOIC-16
MPQ2907	PNP	40	0.6	100	150	200	8	0.4	10	150	CD2	TO-116
MMPQ3467	PNP	40	1	40	500	175	25	0.5	10	500	CD6	SOIC-16
MPQ3467	PNP	40	1	40	500	175	25	0.5	10	500	CD2	TO-116
MMPQ3906	PNP	40	0.2	75	10	200	4.5	0.25	10	10	CD6	SOIC-16
MPQ3906	PNP	40	0.2	75	10	200	4.5	0.25	10	10	CD2	TO-116
MMPQ2907A	PNP	60	0.6	100	150	200	8	0.4	10	150	CD6	SOIC-16

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# Surface Mount Devices

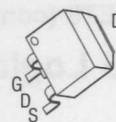
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# Power MOSFETS

## TO-263AB DMOS



Surface Mount Devices

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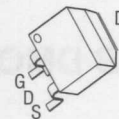
### N Channel

(Volts) Min	Device	$r_{DS(on)}$ @ $I_D/V_{GS}$		$I_D$ (Amps) Max	$P_D$ (Watts) Max
		(m $\Omega$ ) Max	(Amps/Volts)		
100	NDB710A	38	21/10	42	150
	NDB710AE				
	NDB710B	42	21/10	40	
	NDB710BE				
	NDB610A	65	13/10	26	100
	NDB610AE				
	NDB610B	80	12/10	24	
	NDB610BE				
	NDB510A	120	7.5/10	15	60
	NDB510AE				
	NDB510B	150	6.5/10	13	
	NDB510BE				
	NDB410A	250	4/10	8	40
	NDB410AE				
	NDB410B	300	3.5/10	7	
	NDB410BE				
80	NDB708A	22	31/10	60	150
	NDB708AE				
	NDB708B	25	27/10	52	
	NDB708BE				
	NDB608A	42	18/10	36	100
	NDB608AE				
	NDB608B	45	16/10	32	
	NDB608BE				
	NDB508A	80	9.5/10	19	60
	NDB508AE				
	NDB508B	100	8.5/10	17	
	NDB508BE				
	NDB408A	160	5.5/10	11	40
	NDB408AE				
	NDB408B	200	5/10	10	
	NDB408BE				

### N Channel

(Volts) Min	Device	$r_{DS(on)}$ @ $I_D/V_{GS}$		$I_D$ (Amps) Max	$P_D$ (Watts) Max
		(m $\Omega$ ) Max	(Amps/Volts)		
60	NDB706A	15	40/10	75	150
	NDB706AE				
	NDB706B	18	35/10	70	
	NDB706BE				
	NDB606A	25	24/10	48	100
	NDB606AE				
	NDB606B	28	21/10	42	
	NDB606BE				
	NDB506A	50	13/10	26	60
	NDB506AE				
	NDB506B	60	12/10	24	
	NDB506BE				
	NDB406A	100	7.5/10	15	40
	NDB406AE				
	NDB406B	150	6/10	12	
	NDB406BE				
50	NDB705A	15	40/10	75	150
	NDB705AE				
	NDB705B	18	35/10	70	
	NDB705BE				
	NDB605A	25	24/10	48	100
	NDB605AE				
	NDB605B	28	21/10	42	
	NDB605BE				
	NDB505A	50	13/10	26	60
	NDB505AE				
	NDB505B	60	12/10	24	
	NDB505BE				
	NDB405A	100	7.5/10	15	40
	NDB405AE				
	NDB405B	150	6/10	12	
	NDB405BE				

## TO-263AB Logic Level DMOS



## N Channel

(Volts) Min	Device	$r_{DS(on)} @ I_D/V_{GS}$		$I_D$ (Amps) Max	$P_D$ (Watts) Max
		(mΩ) Max	(Amps/Volts)		
100	NDB710AEL	38	21/5	42	150
	NDB710AL				
	NDB710BEL	42	21/5	40	
	NDB710BL				
	NDB610AEL	65	13/5	26	100
	NDB610AL				
	NDB610BEL	80	12/5	24	
	NDB610BL				
	NDB510AEL	120	7.5/5	15	60
	NDB510AL				
	NDB510BEL	150	6.5/5	13	
	NDB510BL				
	NDB410AEL	250	4/5	8	40
	NDB410AL				
	NDB410BEL	300	3.5/5	7	
	NDB410BL				
80	NDB708AEL	22	19/5	60	150
	NDB708AL				
	NDB708BEL	25	18/5	52	
	NDB708BL				
	NDB608AEL	42	18/5	36	100
	NDB608AL				
	NDB608BEL	45	16/5	32	
	NDB608BL				
	NDB508AEL	80	9.5/5	19	60
	NDB508AL				
	NDB508BEL	100	8.5/5	17	
	NDB508BL				
	NDB408AEL	160	5.5/5	11	40
	NDB408AL				
	NDB408BEL	200	5/5	10	
	NDB408BL				

## N Channel

(Volts) Min	Device	$r_{DS(on)} @ I_D/V_{GS}$		$I_D$ (Amps) Max	$P_D$ (Watts) Max
		(mΩ) Max	(Amps/Volts)		
60	NDB706AEL	15	40/5	75	150
	NDB706AL				
	NDB706BEL	18	35/5	70	
	NDB706BL				
	NDB606AEL	25	24/5	48	100
	NDB606AL				
	NDB606BEL	28	21/5	42	
	NDB606BL				
	NDB506AEL	50	13/5	26	60
	NDB506AL				
	NDB506BEL	60	12/5	24	
	NDB506BL				
	NDB406AEL	100	7.5/5	15	40
	NDB406AL				
	NDB406BEL	150	6/5	12	
	NDB406BL				
50	NDB705AEL	15	40/5	75	150
	NDB705AL				
	NDB705BEL	18	35/5	70	
	NDB705BL				
	NDB605AEL	25	24/5	48	100
	NDB605AL				
	NDB605BEL	28	21/5	42	
	NDB605BL				
	NDB505AEL	50	13/5	26	60
	NDB505AL				
	NDB505BEL	60	12/5	24	
	NDB505BL				
	NDB405AEL	100	7.5/5	15	40
	NDB405AL				
	NDB405BEL	150	6/5	12	
	NDB405BL				

Power MOSFETS (continued)  
TO-252 (D-PAK) DMOS

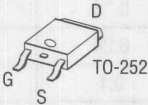
N Channel

(Volts) Min	Device	$r_{DS(on)}$ @ $I_D/V_{GS}$		$I_D$ (Amps) Max	$P_D$ (Watts) Max
		(m $\Omega$ ) Max	(Amps/ Volts)		
60	NDD506A	50	9.5/10	19	72
	NDD506AE				
	NDD506B	60	9.0/10	18	72
	NDD506BE				
	NDD406A	100	7.5/10	15	40
	NDD406AE				
	NDD406B	150	6.0/10	12	40
	NDD406BE				
	MTD3055E	150	4.0/10	8	20

TO-252 Logic Level DMOS

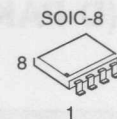
N Channel

(Volts) Min	Device	$r_{DS(on)}$ @ $I_D/V_{GS}$		$I_D$ (Amps) Max	$P_D$ (Watts) Max
		(m $\Omega$ ) Max	(Amps/ Volts)		
60	NDD506AL	50	9.5/5	19	72
	NDD506AEL				
	NDD506BL	60	9.0/5	18	72
	NDD506BEL				
	NDD406AL	100	7.5/5	15	40
	NDD406AEL				
	NDD406BL	150	6.0/5	12	40
	NDD406BEL				
	MTD3055EL	180	6.0/5	12	40



# Power MOSFETS (continued)

## SOIC-8 Dual/Single DMOS



### N Channel

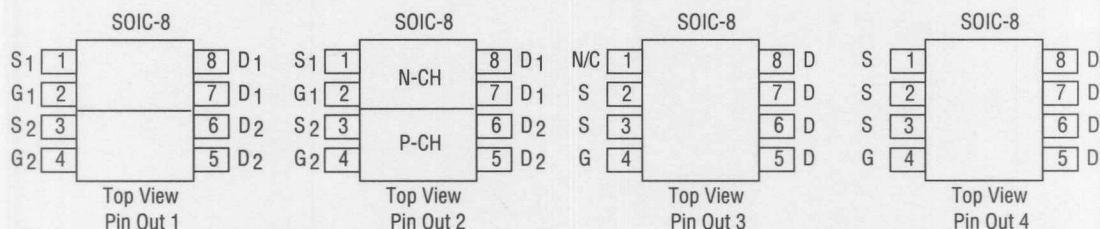
(Volts) Min	Device	$r_{DS(on)}$		$I_D$ (A) Max	$P_D$ (Watts) Max	Configuration	Pin Out
		$V_{GS} = 10V$	$V_{GS} = 4.5V$				
30	NDS9410*	0.03	0.05	7	2	Single	3
60	NDS9945	0.1	0.2	3.5	2	Dual	1
50	NDS9955	0.13	0.2	3	2	Dual	1
20	NDS9956	0.1	0.2	3.5	2	Dual	1

\* Advance Information.

### P Channel

(Volts) Min	Device	$r_{DS(on)}$		$I_D$ (A) Max	$P_D$ (Watts) Max	Configuration	Pin Out
		$V_{GS} = 10V$	$V_{GS} = 4.5V$				
-20	NDS9400*	0.25	0.4	-2.5	2	Single	3
-20	NDS9405*	0.1	0.16	-4.3	2	Single	3
-60	NDS9407*	0.15	0.24	-3.3	2	Single	4
-20	NDS9430*	0.06	0.1	-5.3	2	Single	4
-30	NDS9435*	0.07	0.1	-5.3	2	Single	4
-20	NDS9947*	0.11	0.19	-3.5	2	Dual	1
-60	NDS9948*	0.25	0.5	-2.3	2	Dual	1
-20	NDS9953	0.25	0.4	-2.3	2	Dual	1

\* Advance Information.



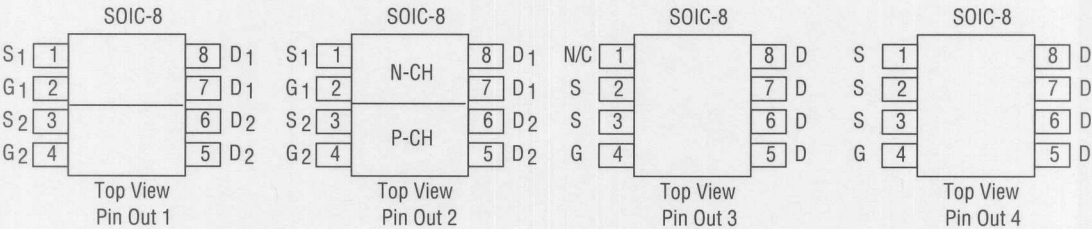
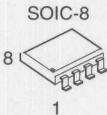
Power MOSFETS (continued)

Complementary N-P Channel

Surface Mount Devices

(Volts) Min	Device	$r_{DS(on)}$		$I_D$ (A) Max	$P_D$ (Watts) Max	Configuration	Pin Out
		$V_{GS} = 10V$	$V_{GS} = 4.5V$				
20	NDS9942	0.125	0.25	3	2	N Channel	2
-20		0.2	0.35	-2.5		P Channel	
20	NDS9943*	0.125	0.25	3	2	N Channel	2
-20		0.16	0.3	-2.8		P Channel	
25	NDS9952	0.1	0.15	3	2	N Channel	2
-25		0.25	0.4	-2.3		P Channel	
20	NDS9958*	0.1	0.15	3.5	2	N Channel	2
-20		0.11	0.19	-3		P Channel	

\* Advance Information.

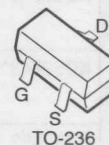


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# Signal MOSFETS N Channel TO-236

$V_{(BR)DSS}$ (Volts) Min	Device	$R_{DS(on)}$ ( $\Omega$ ) Max	@ $I_D / V_{GS}$ (Amps/Volts)	$I_D$ (Amps) Max	Package	$P_D$ (mW) Max	Marking
60	NDS7002A	2.0	0.5/10	0.28	TO-236*	300	712
	MMBF170	5.0	0.2/10	0.5	TO-236*	300	6Z
	2N7002	7.5	0.5/10	0.115	TO-236*	200	702
* TO-236AB is standard for all devices.							



# JFET General Purpose

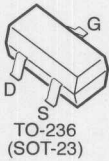
Surface Mount Devices

## P Channel

Device	BV <sub>GSS</sub> (V) Min	V <sub>P</sub> @ V <sub>DS</sub> I <sub>D</sub>				G <sub>fs</sub> (mmho)		Ciss (pF) Max	Crss (pF) Max	en @ Freq		Package	Marking
		(V)		(V)	(nA)					Max	(Hz)		
		Min	Max			Min	Max						
MMBF5460	40	0.75	6	-15	1000	1	4	7	2	115	100	TO-236*	6E
MMBF5461	40	1	7.5	-15	1000	1.5	5	7	2	115	100	TO-236*	61U
MMBF5462	40	1.8	9	-15	1000	2	6	7	2	115	100	TO-236*	61V
MMBFJ270	30	0.5	2	-15	1	6	15	t20	t5	t10	1000	TO-236*	62S
MMBFJ271	30	1.5	4.5	-15	1	8	18	t20	t5	t10	1000	TO-236*	62T
* TO-236AB is standard for all devices. t=typical value													

## N Channel

Device	BV <sub>GSS</sub> (V) Min	V <sub>P</sub> @ V <sub>DS</sub> I <sub>D</sub>				G <sub>fs</sub> (mmho)		C <sub>iss</sub> (pF) Max	C <sub>rss</sub> (pF) Max	en @ Freq		Package	Marking
		(V)		(V)	(nA)	Min	Max			Max	(Hz)		
		Min	Max										
BSR58	40	0.8	4	15	1				t5			TO-236*	M6
MMBF5457	25	0.5	6	15	10	2	5	7	3			TO-236*	6D
MMBF5458	25	1	7	15	10	1.5	5.5	7	3			TO-236*	61S
MMBF5459	25	2	8	15	10	2	6	7	3			TO-236*	61T
MMBFJ201	40	0.3	1.5	20	10	0.5						TO-236*	62P
MMBFJ202	40	0.8	4	20	10	1						TO-236*	62Q
MMBFJ203	40	2	10	20	10	1.5						TO-236*	62R
* TO-236AB is standard for all devices. t=typical value													



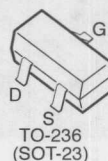
# JFET RF, VHF, UHF Amplifiers

## N Channel

Device	BV <sub>GSS</sub> (V) Min	V <sub>P</sub> @ V <sub>DS</sub> I <sub>D</sub>				ReYfsl (mmho) @ f		Re(Yos) (μmho) @ f		Ciss (pF) Max	Crss (pF) Max	NF		Package	Marking
		(V)		(V)	(nA)							(dB) @ Rg = 1k			
		Min	Max			Min	(MHz)	Max	(MHz)			Max	(MHz)		
MMBF4416	30	2.5	6	15	1	4	400	100	400	4	0.8	4	400	TO-236*	6A
MMBF5484	25	0.3	3	15	10	2.5	100	75	100	5	1	3	100	TO-236*	6B
MMBF5485	25	0.5	4	15	10	3	400	100	400	5	1	4	400	TO-236*	6M
MMBF5486	25	2	6	15	10	3.5	400	100	400	5	1	4	400	TO-236*	6H
MMBFJ304	30	2	6	15	1	t4.2	400	t80	100					TO-236*	63Q
MMBFJ305	30	0.5	3	15	1	t3.0	400	t80	100					TO-236*	6Q
MMBFJ309	25	1	4	10	1	10	0.001	150	0.001	7.5	2.5			TO-236*	6U
MMBFJ310	25	2	6.5	10	1	8	0.001	150	0.001	7.5	2.5			TO-236*	6T

\* TO-236AB is standard for all devices.

t=typical value



# JFET Switches/Choppers

Surface Mount Devices

## P Channel

Device	BV <sub>GSS</sub> (V) Min	V <sub>P</sub> @ V <sub>DS</sub> I <sub>D</sub>				R <sub>DS(on)</sub> (Ω) @ I <sub>D</sub>		Ciss (pF) Max	Crss (pF) Max	ton (ns) Max	toff (ns) Max	Package	Marking
		(V)		(V)	(nA)								
		Min	Max			Min	(mA)						
MMBF5114	30	5	10	-15	1	75	1	25	7	16	21	TO-236*	61N
MMBF5115	30	3	6	-15	1	100	1	25	7	30	38	TO-236*	61P
MMBF5116	30	1	4	-15	1	150	1	25	7	42	60	TO-236*	61Q
MMBFJ174	30	5	10	-15	10	85	1	11	5.5	2	5	TO-236*	6V
MMBFJ175	30	3	6	-15	10	125	0.5	11	5.5	5	10	TO-236*	6W
MMBFJ176	30	1	4	-15	10	250	0.25	11	5.5	15	15	TO-236*	6X
MMBFJ177	30	0.8	2.25	-15	10	300	0.1	11	5.5	20	20	TO-236*	6Y

\* TO-236AB is standard for all devices.

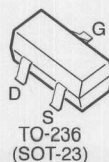
\* TO-236AB is standard for all devices.

## N Channel

Device	BV <sub>GSS</sub> (V) Min	V <sub>P</sub> @ V <sub>DS</sub> I <sub>D</sub>				R <sub>DS(on)</sub> (Ω) @ I <sub>D</sub>		Ciss (pF) Max	Crss (pF) Max	ton (ns) Max	toff (ns) Max	Package	Marking
		(V)		(V)	(nA)								
		Min	Max			Min	(mA)						
MMBF4091	40	5	10	20	1	30	1	16	5	25	40	TO-236*	61J
MMBF4092	40	2	7	20	1	50	1	16	5	35	60	TO-236*	61K
MMBF4093	40	1	5	20	1	80	1	16	5	60	80	TO-236*	61L
MMBF4391	40	4	10	20	1	30	1	14	3.5	15	20	TO-236*	6J
MMBF4392	40	2	5	20	1	60	1	14	3.5	15	35	TO-236*	6K
MMBF4393	40	0.5	3	20	1	100	1	14	3.5	15	55	TO-236*	6G
MMBF4859	30	4	10	15	0.5	25		18	8	9	25	TO-236*	61M
MMBF4860	30	2	6	15	0.5	40		18	8	10	50	TO-236*	6F
MMBF4861	30	0.8	4	15	0.5	60		18	8	20	100	TO-236*	6N
MMBFJ111	35	3	10	5	1000	30	1					TO-236*	6P
MMBFJ112	35	1	5	5	1000	50	1					TO-236*	6R
MMBFJ113	35	0.5	3	5	1000	100	1					TO-236*	6S

\* TO-236AB is standard for all devices.

\* TO-236AB is standard for all devices.

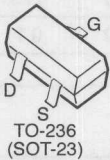


# JFET Ultra Low Input Current Amplifiers

## N Channel

Device	BV <sub>GSS</sub> (V) Min	I <sub>GSS</sub> (pA) Max	V <sub>P</sub> @ V <sub>DS</sub> I <sub>D</sub>				G <sub>fs</sub> (μmho)		Ciss (pF) Max	Crss (pF) Max	Package	Marking
			(V)		(V)	(nA)						
			Min	Max			Min	Max				
MMBF4117	40	10	0.6	2.8	10	1	20	210	3	1.5	TO-236*	61A
MMBF4118	40	10	1	3	10	1	80	250	3	1.5	TO-236*	61C
MMBF4119	40	10	2	6	10	1	100	330	3	1.5	TO-236*	61E

\* TO-236AB is standard for all devices.

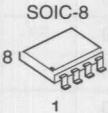




Dual JFETs

N-Channel

Device	V <sub>P</sub> (V)		G <sub>fs</sub> (mmho)		V <sub>GS1-2</sub> V <sub>os</sub> (mV) Max	Drift (μV/C) ΔV <sub>GS</sub> Max	I <sub>DSS</sub> Match %	G <sub>fs</sub> Match %	Package
	Min	Max	Min	Max					
NPDS404	0.5	2.5	2	7	15	25			SOIC-8
NPDS405	0.5	2.5	2	7	20	40			SOIC-8
NPDS406	0.5	2.5	2	7	40	80			SOIC-8
NPDS5564	0.5	3	7.5	12.5	5	10		5	SOIC-8
NPDS5565	0.5	3	7.5	12.5	10	25		10	SOIC-8
NPDS5566	0.5	3	7.5	12.5	20	50		10	SOIC-8
NPDS5911	1	5	5	10	10	20	5	5	SOIC-8
NPDS5912	1	5	5	10	15	40	5	5	SOIC-8



# Silicon Single Junction Diodes

$V_{RRM}$ (Volts) Min	Device	$I_{RRM}$ (nA) Max	$V_{FM}$ @ $I_F$		$t_{rr}$ (ns) Max	Package	Configuration	Marking Color Bands** 1st/2nd
			(Volts) Max	(mA)				
200	BAS21	100	1.0	100	50	TO-236*	1	A82
	MMBD1401	100	1.0	200	50	TO-236*	1	29
	MMBD1402	100	1.0	200	50	TO-236*	2	31
	MMBD1403	100	1.0	200	50	TO-236*	3	32
	MMBD1404	100	1.0	200	50	TO-236*	4	33
	MMBD1405	100	1.0	200	50	TO-236*	5	34
	MMBD1501A	1.0	1.1	200		TO-236*	1	11A
	MMBD1502A	1.0	1.1	200		TO-236*	2	12A
	MMBD1503A	1.0	1.1	200		TO-236*	3	13A
	MMBD1504A	1.0	1.1	200		TO-236*	4	14A
	MMBD1505A	1.0	1.1	200		TO-236*	5	15A
150	BAS20	100	1.0	100	50	TO-236*	1	A81
	FDLL300	1.0	1.0	200		LL-34		BRN/GRN
	FDLL3595	1.0	1.0	200		LL-34		ORN/YEL
120	BAS19	100	1.0	100	50	TO-236*	1	A8
	BAS29	100	0.84	50	50	TO-236*	1	L20
	BAS31	100	0.84	50	50	TO-236*	3	L21
	BAS35	100	0.84	50	50	TO-236*	5	L22
100	FDLL4148	25	1.0	10	4.0	LL-34		BLK/BRN
	FDLL4448	25	1.0	100	4.0	LL-34		BRN/BLK
	FDLL914	25	1.0	10	4.0	LL-34		BLK/BRN
	MMBD1201	25	1.0	200	4.0	TO-236*	1	24
	MMBD1202	25	1.0	200	4.0	TO-236*	2	25

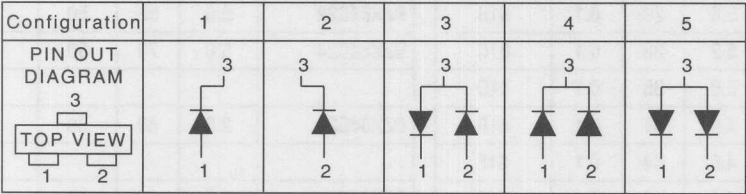
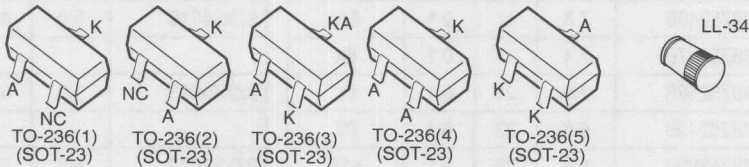
\* TO-236AB is standard for all devices.

\*\* Color Code: BLK=Black; ORN=Orange; BLU=Blue; BRN=Brown; YEL=Yellow; PUR=Purple; RED=Red; GRN=Green; GRY=Gray; WHT=White



$V_{RRM}$ (Volts) Min	Device	$I_{RRM}$ (nA) Max	$V_{FM}$ @ $I_F$		$t_{rr}$ (ns) Max	Package	Configuration	Marking Color Bands** 1st/2nd
			(Volts) Max	(mA)				
100	MMBD1203	25	1.0	200	4.0	TO-236*	3	26
	MMBD1204	25	1.0	200	4.0	TO-236*	4	27
	MMBD1205	25	1.0	200	4.0	TO-236*	5	28
	MMBD4148	25	1.0	10	4.0	TO-236*	1	5H
	MMBD914	25	1.0	10	4.0	TO-236*	1	5D
75	BAS16	1000	1.1	50	6.0	TO-236*	1	A6
	FDLL4150	100	1.0	200	4.0	LL-34		BLK/ORN
	FDLL600	100	1.0	200	4.0	LL-34		RED/WHT
70	BAV70	5000	1.1	50	6.0	TO-236*	4	A4
	BAV99	2500	1.1	50	6.0	TO-236*	3	A7
	BAW56	2500	1.1	50	6.0	TO-236*	5	A1
50	BAV74	100	1.0	100	4.0	TO-236*	4	JA
30	MMBD1701	50	1.1	50	0.70	TO-236*	1	85
	MMBD1702	50	1.1	50	0.70	TO-236*	2	86
	MMBD1703	50	1.1	50	0.70	TO-236*	3	87
	MMBD1704	50	1.1	50	0.70	TO-236*	4	88
	MMBD1705	50	1.1	50	0.70	TO-236*	5	89

\* TO-236AB is standard for all devices.  
\*\* Color Code: BLK=Black; ORN=Orange; BLU=Blue; BRN=Brown; YEL=Yellow; PUR=Purple; RED=Red; GRN=Green; GRY=Gray; WHT=White



# TO-236AB (SOT-23) Zener Diodes

$V_Z$ (Volts)	Tolerance 5%	$I_{ZT}$ (mA)	$Z_Z$ ( $\Omega$ )	$I_R$ ( $\mu$ A)	Marking
3.3	MMBZ5226B	20	28	25	8A
3.6	MMBZ5227B	20	24	15	8B
3.9	MMBZ5228B	20	23	10	8C
4.3	MMBZ5229B	20	22	5.0	8D
4.7	MMBZ5230B	20	19	5.0	8E
5.1	MMBZ5231B	20	17	5.0	8F
5.6	MMBZ5232B	20	11	5.0	8G
6.0	MMBZ5233B	20	7.0	5.0	8H
6.2	MMBZ5234B	20	7.0	5.0	8J
6.8	MMBZ5235B	20	5.0	3.0	8K
7.5	MMBZ5236B	20	6.0	3.0	8L
8.2	MMBZ5237B	20	8.0	3.0	8M
8.7	MMBZ5238B	20	8.0	3.0	8N
9.1	MMBZ5239B	20	10	3.0	8P
10	MMBZ5240B	20	17	3.0	8Q
11	MMBZ5241B	20	22	2.0	8R
12	MMBZ5242B	20	30	1.0	8S
13	MMBZ5243B	9.5	13	0.5	8T
14	MMBZ5244B	9.0	15	0.1	8U
15	MMBZ5245B	8.5	16	0.1	8V
16	MMBZ5246B	7.8	17	0.1	8W
17	MMBZ5247B	7.4	19	0.1	8X
18	MMBZ5248B	7.0	21	0.1	8Y
19	MMBZ5249B	6.6	23	0.1	8Z
20	MMBZ5250B	6.2	25	0.1	81A
22	MMBZ5251B	5.6	29	0.1	81B
24	MMBZ5252B	5.2	33	0.1	81C
25	MMBZ5253B	5.0	35	0.1	81D
27	MMBZ5254B	4.6	41	0.1	81E
28	MMBZ5255B	4.5	44	0.1	81F
30	MMBZ5256B	4.2	49	0.1	81G
33	MMBZ5257B	3.8	58	0.1	81H

Tolerance 5%	$I_{ZT}$ (mA)	$Z_Z$ ( $\Omega$ )	$I_R$ (nA)	Marking
BZX84C4V7	5.0	80	3000	Z1
BZX84C5V1	5.0	60	2000	Z2
BZX84C5V6	5.0	40	1000	Z3
BZX84C6V2	5.0	10	3000	Z4
BZX84C6V8	5.0	15	2000	Z5
BZX84C7V5	5.0	15	1000	Z6
BZX84C8V2	5.0	15	700	Z7
BZX84C9V1	5.0	15	500	Z8
BZX84C10	5.0	20	200	Z9
BZX84C11	5.0	20	100	Y1
BZX84C12	5.0	25	100	Y2
BZX84C13	5.0	30	100	Y3
BZX84C15	5.0	30	50	Y4
BZX84C16	5.0	40	50	Y5
BZX84C18	5.0	45	50	Y6
BZX84C20	5.0	55	50	Y7
BZX84C22	5.0	55	50	Y8
BZX84C24	5.0	70	50	Y9
BZX84C27	2.0	80	50	Y10
BZX84C30	2.0	80	50	Y11
BZX84C33	2.0	80	50	Y12





# Bipolar General Purpose Amplifiers and Switches

Surface Mount Devices

$V_{CE0(sust)}$ (Volts) Min	Device		$I_C$ (mA) Max	$h_{FE} @ I_C$			$f_T @ I_C$		NF (dB) Max	Package	$P_D (Amb)$ (mW) @25°C	Marking NPN/PNP
	NPN	PNP		Min	Max	mA	(MHz) Min	mA				
65	BC846		100	110		0.01	300 Typ	100		TO-236*	350	Note (1)
					450	2.0		100		TO-236*	350	
		BC856	100	125	475	2.0	300 Typ	10	10	TO-236*	350	Note (2)
60		MMBT2907A	600	100	300	150	200			TO-236*		2F
45	BC817	BC807	1000	100	600	100	200 Typ	10	10	TO-236*	350	Note (3)/(4)
	BC847		100	110		0.01	300 Typ			TO-236*		Note (5)
					800	2.0		10	10	TO-236*	350	
	BC850		100	200		0.01	300 Typ			TO-236*		Note (6)
					800	2.0		10	4.0	TO-236*	350	
	BCX19	BCX17	1000	100	600	100	100 Typ	10	3.0	TO-236*	350	U1
	BCX70		100	120	630	2.0	125			TO-236*		Note (7)
	MMBT100	MMBT200	500	100	450	10	250	10	3.0	TO-236*	350	N1 / N2
		BC857	100	125	800	2.0	300 Typ	50		TO-236*	350	Note (8)
		BC860	100	125	800	2.0	300 Typ	50		TO-236*	350	Note (9)
40		BCX71	100	120	630	2.0	125 Typ	50		TO-236*	350	Note (10)
	MMBT2222A		500	100	300	150	300	50		TO-236*	350	1P
	MMBT3904		200	100	300	10	300	10	6.0	TO-236*	350	1A
	MMBT4400		600	50	150	150	200	20	4.0	TO-236*	350	83
	MMBT4401		600	100	300	150	250	20		TO-236*	350	2X
		MMBT2907	600	100	300	150	200	20		TO-236*	350	2B
		MMBT3906	200	100	300	10	250	10	5.0	TO-236*	350	2A
		MMBT4402	600	50	150	150	150	10	4.0	TO-236*	350	3N
32		MMBT4403	600	100	300	150	200	10	6.0	TO-236*	350	2T
	BCW33		100	420	800	2.0	300 Typ	10	5.0	TO-236*	350	D3

\* TO-236AB is standard for all devices.

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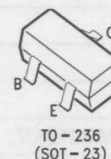
# Bipolar General Purpose Amplifiers and Switches (continued)

V <sub>CE0(sust)</sub> (Volts) Min	Device		I <sub>C</sub> (mA) Max	h <sub>FE</sub> @ I <sub>C</sub>			f <sub>T</sub> @ I <sub>C</sub>		NF (dB) Max	Package	P <sub>D</sub> (Amb) (mW) @25°C	Marking NPN/PNP
	NPN	PNP		Min	Max	mA	(MHz) Min	mA				
30	BC848		100	110		0.01	300 Typ	10	5.0	TO-236*	350	Note (11)
					800	2.0		10	4.0	TO-236*	350	
	BC849		100	200		0.01	300 Typ	20		TO-236*	350	Note (12)
					800	2.0		20		TO-236*	350	
	MMBT2222		500	100	300	150	250	20		TO-236*	350	1B
	MMBT4123		200	50	150	2.0	250	20		TO-236*	350	ZE
		BC858	100	125	800	2.0	300 Typ	10	10	TO-236*	350	Note (13)
		BC859	100	125	800	2.0	300 Typ	10	10	TO-236*	350	Note (14)
25		MMBT4125	200	50	150	2.0	200	10	10	TO-236*	350	ZD
	BC818	BC808	1000	100	600	100	150 Typ	10	4.0	TO-236*	350	Note (15)/(16)
	BCX18		1000	100	600	100	200 Typ	10	3.0	TO-236*	350	T2
	BCX20		1000	100	600	100	130 Typ	20	6.0	TO-236*	350	U2
	MMBT4124		200	120	360	2.0	300	50		TO-236*	350	ZC
		MMBT4126	200	120	360	2.0	250	50		TO-236*	350	ZF

Note :

- (1) BC846 - Suffix/[Marking] : A/[1A], B/[1B]
- (2) BC856 - Suffix/[Marking] : A/[3A], B/[3B]
- (3) BC817 - Suffix/[Marking] : -16/[6A], -25/[6B], -40/[6C]
- (4) BC807 - Suffix/[Marking] : -16/[5A], -25/[5B], -40/[5C]
- (5) BC847 - Suffix/[Marking] : A/[1E], B/[1F], C/[1G]
- (6) BC850 - Suffix/[Marking] : B/[2F], C/[2G]
- (7) BCX70 - Suffix/[Marking] : G/[AG], H/[AH], J/[AJ]
- (8) BC857 - Suffix/[Marking] : A/[3E], B/[3F], C/[3G]
- (9) BC860 - Suffix/[Marking] : A/[4E], B/[4F], C/[4G]
- (10) BCX71 - Suffix/[Marking] : G/[BG], H/[BH], J/[BJ], K/[BK]
- (11) BC848 - Suffix/[Marking] : A/[1J], B/[1K], C/[1L]
- (12) BC849 - Suffix/[Marking] : B/[2B], C/[2C]
- (13) BC858 - Suffix/[Marking] : A/[3J], B/[3K], C/[3L]
- (14) BC859 - Suffix/[Marking] : A/[4A], B/[4B], C/[4C]
- (15) BC818 - Suffix/[Marking] : -16/[6E], -25/[6F], -40/[6G]
- (16) BC808 - Suffix/[Marking] : -16/[5E], -25/[5F], -40/[5G]

\* TO-236AB is standard for all devices.

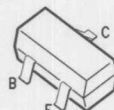


# Bipolar High Speed Saturated Switching Transistors

Surface Mount Devices

$V_{CE0(Sust)}$ (Volts) Min	Device		$t_{on}$ (ns) Max	$t_{off} @ I_C$		$h_{FE} @ I_C$		$V_{CE(sat)} @ I_C \& I_B$			$f_T$ (MHz) Min	Package	$P_D (Amb)$ (mW) @25°C	Marking
	NPN	PNP		(ns) Max	mA	Min	mA	(Volts) Max	mA	mA				
60		MMBT2907A	45	100	150	100	150	0.4	150	15	200	TO-236*	350	2F
40	BSR17A		70	250	10	100	10	0.2	10	1.0	300	TO-236*	350	U92
	MMBT2222A		35	285	150	100	150	0.3	150	15	300	TO-236*	350	1P
	MMBT3904		70	250	10	100	10	0.2	10	1.0	300	TO-236*	350	1A
	MMBT4401		35	255	150	100	300	0.4	150	15	250	TO-236*	350	2X
		MMBT3906	70	300	10	100	10	0.25	10	1.0	250	TO-236*	350	2A
		MMBT4403	35	255	150	100	150	0.4	150	15	200	TO-236*	350	2T
15	MMBT2369A		12	18	10	40	10	0.2	10	1.0	500	TO-236*	350	1S
	MMBT3646		18	28	300	30	30	0.2	30	3.0	350	TO-236*	350	23
		MMBT4209	15	20	10	50	10	0.18	10	1.0	850	TO-236*	350	22
		MMBT5771	15	20	10	50	10	0.18	10	1.0	850	TO-236*	350	3R
12	BSV52		12	18	10	40	10	0.25	10	1.0	500	TO-236*	350	B2
		MMBT3640	25	35	50	30	10	0.2	10	1.0	500	TO-236*	350	2J
		MMBT4258	15	20	10	30	50	0.15	10	1.0	700	TO-236*	350	78

\* TO-236AB is standard for all devices.

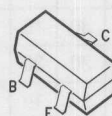


TO-236  
(SOT-23)

# Bipolar High Voltage Amplifiers

$V_{CE0(Sust)}$ (Volts) Min	Device		$I_C$ (mA) Max	$h_{FE} @ I_C$		$V_{CE(sat)} @ I_C \text{ \& } I_B$			$f_T$ (MHz) Min	Package	$P_D (Amb)$ (mW) @25°C	Marking
	NPN	PNP		Min	(mA)	(Volts) Min	(mA)	(mA)				
300	MMBTA42		500	40	30	0.5	20	2.0	50	TO-236*	350	1D
		MMBTA92	500	25	30	0.5	20	2.0	50	TO-236*	350	2D
160	MMBT5551		600	80	10	0.2	50	5.0	100	TO-236*	350	3S
		MMBT5401	600	60	10	0.5	50	5.0	100	TO-236*	350	2L
140	MMBT5550		600	60	10	0.25	50	5.0	100	TO-236*	350	1F

\* TO-236AB is standard for all devices.



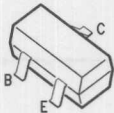
TO-236  
(SOT-23)

# Bipolar Darlington Transistors

Surface Mount Devices

$V_{CE0(sust)}$ (Volts) Min	Device		$I_C$ Max (Amps)	$h_{FE}$ @ $I_C$		$V_{CE(sat)}$ @ $I_C$ & $I_B$			$f_T$ (MHz) Min	Package	$P_D$ (Amb) (Watts) @25°C	Marking NPN/PNP
	NPN	PNP		Min	mA	(Volts) Max	mA	$\mu A$				
30	BCV27	BCV26	1	4,000	1	1.0	100	100		TO-236*	0.35	FF / FD
				10,000	10						0.35	
				20,000	100						0.35	
	MMBTA13		1	5,000	10	1.5	100	100	125	TO-236*	0.35	1M
				10,000	100						0.35	
	MMBTA14		1	10,000	10	1.5	100	100	125	TO-236*	0.35	1N
				20,000	100						0.35	

\* TO-236AB is standard for all devices.



TO - 236  
(SOT - 23)

# Bipolar High Current Drivers

$V_{CE(sust)}$ (Volts) Min	Device		$I_C$ (Amps) Max	$h_{FE} @ I_C$			$V_{CE(sat)} @ I_C \& I_B$			$f_T$ (MHz) Min	Package	$P_D (Amb)$ (Watts) @25°C	Marking NPN/PNP
	NPN	PNP		Min	Max	mA	(Volts) Max	mA	mA				
80	MMBTA06	MMBTA56	0.5	100		100	0.25	100	10	100	TO-236*	0.35	1G / 2G
60	MMBTA05	MMBTA55	0.5	100		100	0.25	100	10	100	TO-236*	0.35	1H / 2H
45	BC818	BC808	1.0	100	600	100	0.7	500	50	100 Typ.	TO-236*	0.3	Note (1) / (2)
	BCX19	BCX17	1.0	100	600	100	0.62	500	50	100 Typ.	TO-236*	0.3	U2 / T2
25	BC817	BC807	1.0	100	600	100	0.7	500	50	100 Typ.	TO-236*	0.3	Note (3) / (4)
	BCX20	BCX18	1.0	100	600	100	0.62	500	50	100 Typ.	TO-236*	0.3	U1 / T1

\* TO-236AB is standard for all devices.

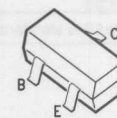
Notes:

(1) BC818 - Suffix/[Marking] : -16/[6E], -25/[6F], -40/[6G]

(2) BC808 - Suffix/[Marking] : -16/[5E], -25/[5F], -40/[5G]

(3) BC817 - Suffix/[Marking] : -16/[6A], -25/[6B], -40/[6C]

(4) BC807 - Suffix/[Marking] : -16/[5A], -25/[5B], -40/[5C]



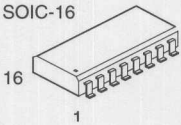
TO - 236  
(SOT - 23)



# Multiple Bipolar Transistors—Quad

Surface Mount Devices

Device	Type	$V_{CE}$ (V) Min	$I_C$ (A) Max	$h_{FE}$ @ $I_C$		$f_T$ MHz Min	$C_{DB}$ pF Max	$V_{CE(sat)}$ @ $I_C$ & $I_B$			Config- uration	Package
				Min	mA			Volts Max	mA	mA		
MMPQ2907A	PNP	60	0.6	100	150	200	8	0.4	10	150	CD6	SOIC-16
MMPQ2907	PNP	40	0.6	100	150	200	8	0.4	10	150	CD6	SOIC-16
MMPQ3467	PNP	40	1	40	500	175	25	0.5	10	500	CD6	SOIC-16
MMPQ3906	PNP	40	0.2	75	10	200	4.5	0.25	10	10	CD6	SOIC-16
MMPQ2222A	NPN	40	0.5	100	150	200	8	0.3	10	150	CD5	SOIC-16
MMPQ3725	NPN	40	1	25	500	250	10	0.45	10	500	CD5	SOIC-16
MMPQ3904	NPN	40	0.2	75	10	250	4	0.2	10	10	CD5	SOIC-16
MMPQ3724	NPN	36	1	35	500	300	12	0.32	10	300	CD5	SOIC-16
MMPQ2222	NPN	30	0.5	100	150	200	8	0.4	10	150	CD5	SOIC-16
MMPQ2369	NPN	15	0.5	40	10	450	4	0.25	10	10	CD5	SOIC-16
MMPQ6700	BOTH	40	0.2	70	10	200	4.5	0.25	10	1	CD7	SOIC-16
MMPQ6502	BOTH	30	0.5	100	150	200	8	0.4	10	150	CD7	SOIC-16





# Ordering Information

Ordering Information / Packaging Options ..... 8-1



# Ordering Information / Packaging Options

## Axial Lead Diodes

No suffix indicates bulk packaging.

### Standard Packaging Options:

T50R indicates tape and reel with 50mm tape spacing.

T50A indicates tape and ammo with 50mm tape spacing.

### Non-Standard Packaging Options:

T26R indicates tape and reel with 26mm tape spacing.

T26A indicates tape and ammo with 26mm tape spacing.

Minimum Order Quantity (Package Size)

	Bulk	Tape and Reel	Tape and Ammo
DO-35	20K (5K)	20K (10K)	20K (5K)
DO-35 Zener	20K (5K)	20K (5K)	20K (5K)
DO-7	6K (6K)	6K (6K)	6K (6K)
DO-41	12K (3K)	12K (3K)	12K (3K)

## SOIC

No suffix indicates Tape and Reel.

Tape and reel (13") standard pack 2500.

L86Z indicates Tube.

## TO-252

No suffix indicates Tape and Reel.

Tape and reel standard pack 2500.

L86Z indicates Tube.

## LL34

No suffix indicates Tape and Reel.

Tape and reel standard pack 2500.

S62Z indicates bulk pack.

## TO-263

No suffix indicates Tube.

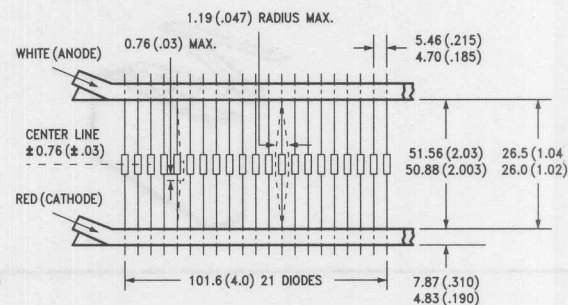
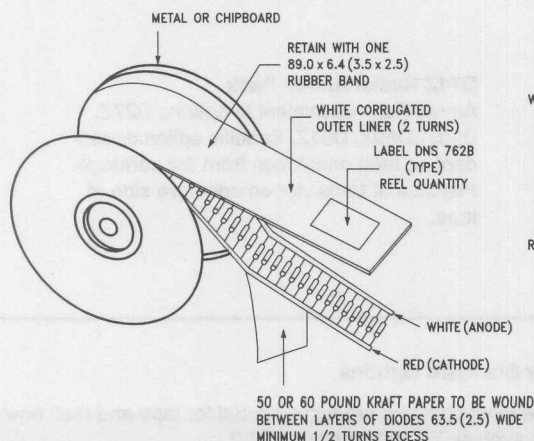
D85Z indicates Tape and Reel.

Tape and reel standard pack 800.

## TO-263AB (SOT23)

No suffix indicates Tape and Reel.

Tape and reel (7") standard pack 3000.





## Ordering Information / Packaging Options (continued)

### Ordering information for TO-92 Transistors

No suffix indicates bulk packaging.

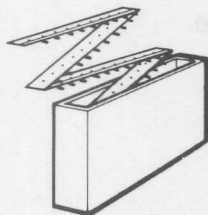
Standard Packaging Options:

1. D74Z and D75Z indicate Tape & Ammo box package.

Example: 2N3904/D74Z. Quantities are 2,000.

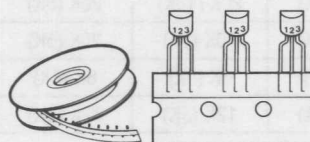
2. D26Z and D27Z indicate Tape & Reel package.

Example: 2N3904/D26Z. Quantities are 2,000.

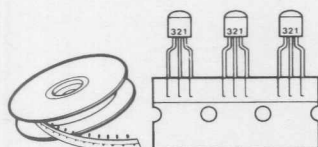


#### D75Z Radial Ammo Pack

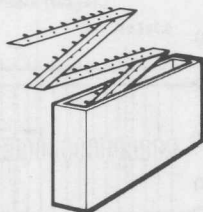
Ammo Pack equivalent to options D26Z, D28Z, D10Z, D11Z. Specific option dependent on feed orientation from the cartridge. Round side of transistor on adhesive side of tape.



**D26Z** = flat side down, tape left side of reel, adhesive on top side, large arbor hole.



**D27Z** = flat side up, tape left side of reel, adhesive on top side, large arbor hole.



#### D74Z Radial Ammo Pack

Ammo Pack equivalent to options D27Z, D29Z, D89Z, D81Z. Specific option dependent on feed orientation from the cartridge. Flat side of transistor on adhesive side of tape.

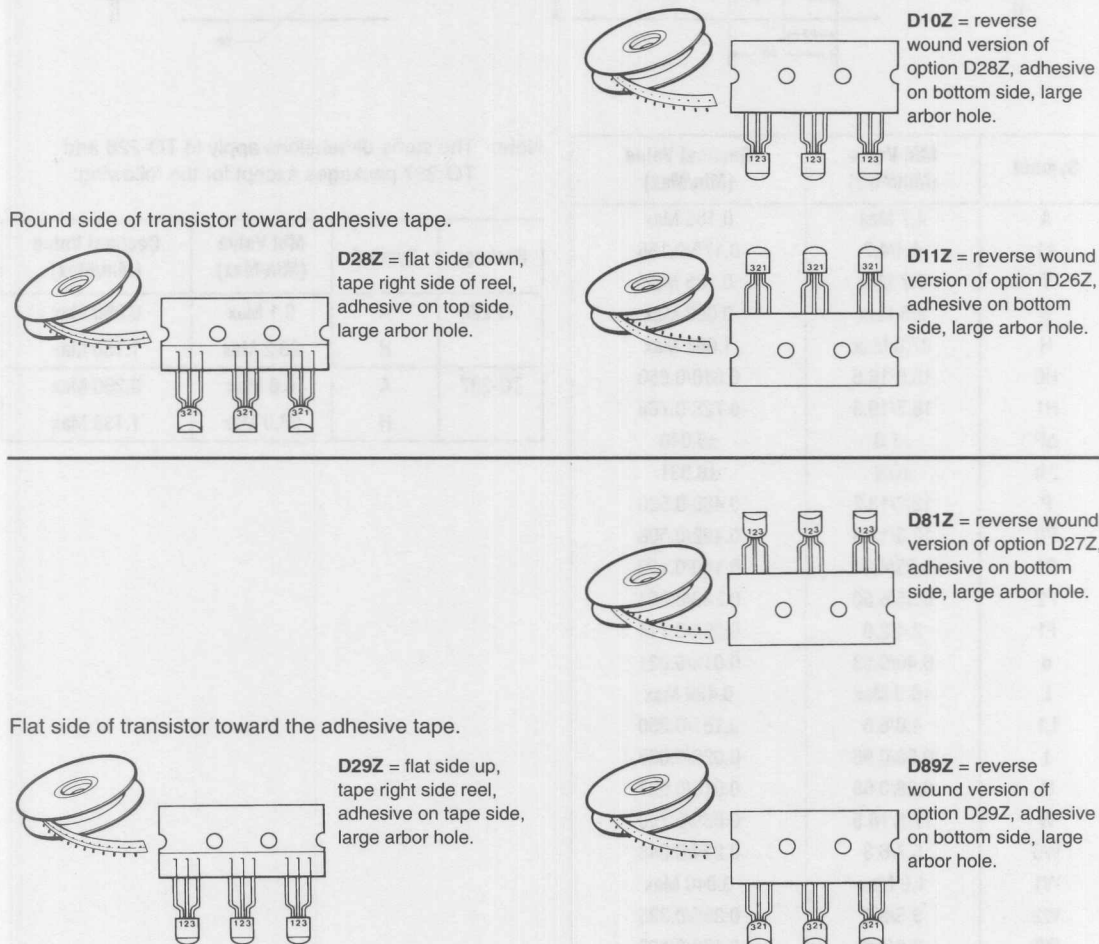
Figure 1. Transistor Standard Options

The drawings show package TO-92 transistors, which is the most common product selected for tape and reel; however, the same information applies to other package styles, such as TO-237 and tall TO-92.

## Ordering Information / Packaging Options (continued)

### 3. Non-Standard Packaging Options

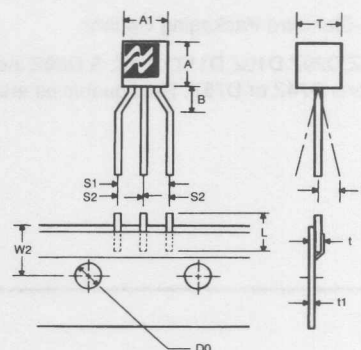
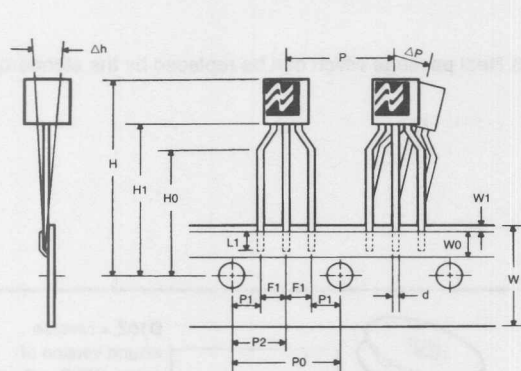
D28Z, D29Z, D10Z, D11Z, D81Z, & D89Z indicates Tape & Reel package which can be replaced by the standard options D74Z or D75Z. Reel quantities are 2,000.



**Figure 2. Transistor Non-Standard Options**

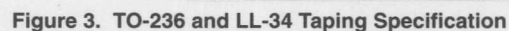
These non-standard options require special handling and re-reeling. This is reflected in longer leadtime and increased cost. National Semiconductor does not recommend these reeling options.

## Ordering Information / Packaging Options (continued)



Note: The same dimensions apply to TO-226 and TO-237 packages except for the following:

Package	Symbol	MM Value (Min/Max)	Decimal Value (Min/Max)
TO-226	A	9.1 Max	0.360 Max
	H	29.2 Max	1.150 Max
TO-237	A	6.6 Max	0.260 Max
	H	28.9 Max	1.138 Max







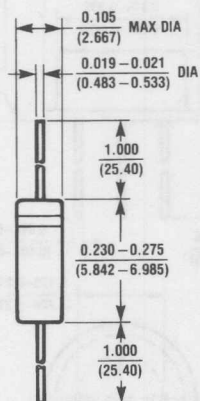
# Package Outlines

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DO-35 (D2) .....	9-1
DO-41 (D4) .....	9-1
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TO-39 (17) Lo-Profile .....	9-2
TO-52 (07, 18) .....	9-2
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Molded Mini-DIP (60, 67) .....	9-8
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14-SOIC (S2) (Diode Arrays) .....	9-9
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TO-252 (D-PAK) .....	9-12
TO-251 (I-PAK) .....	9-13
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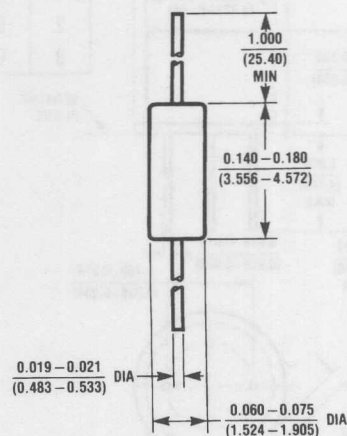


# Package Outlines

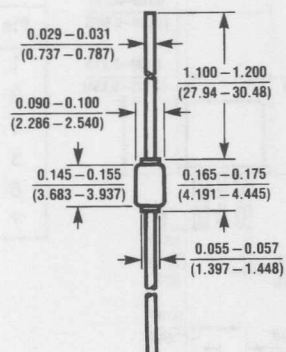
## DO-7 (D1)



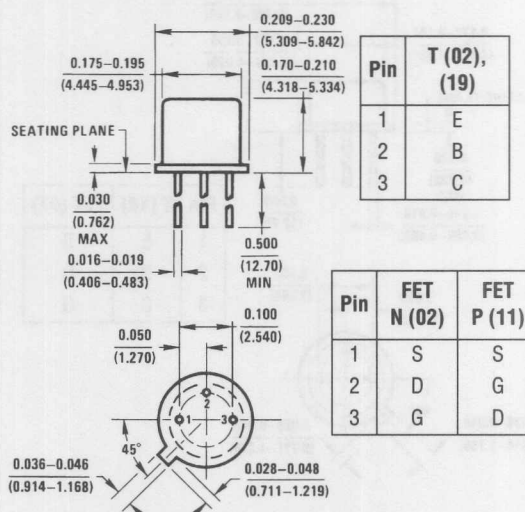
## DO-35 (D2)



## DO-41 (D4)

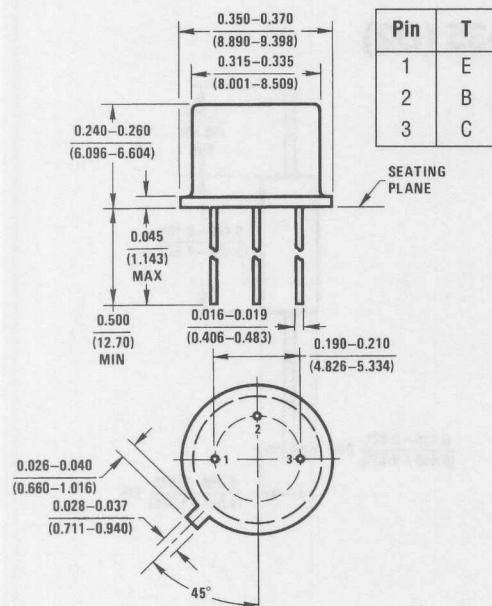


## TO-18 (02, 11, 19)

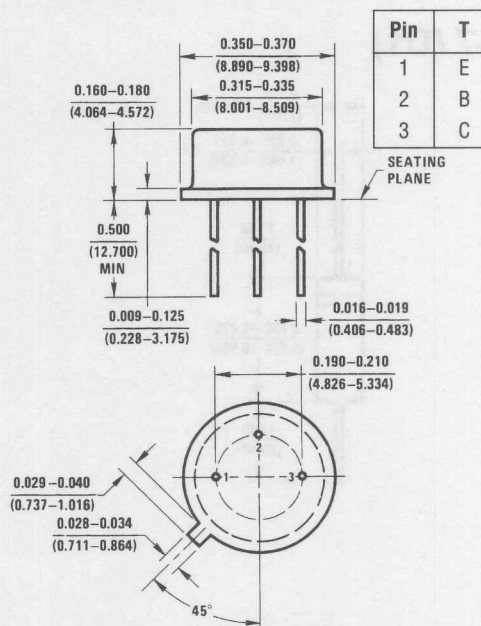


# Package Outlines (continued)

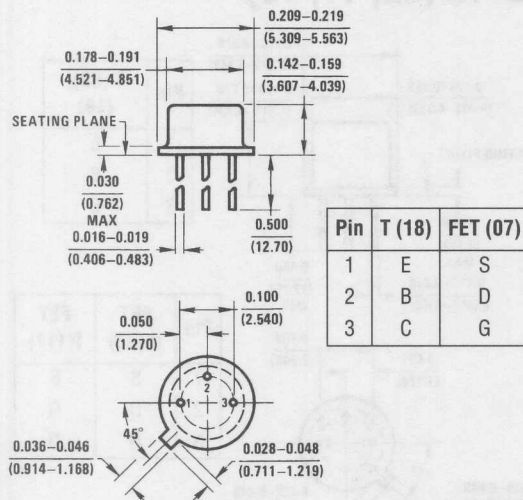
## TO-39 (09, 10)



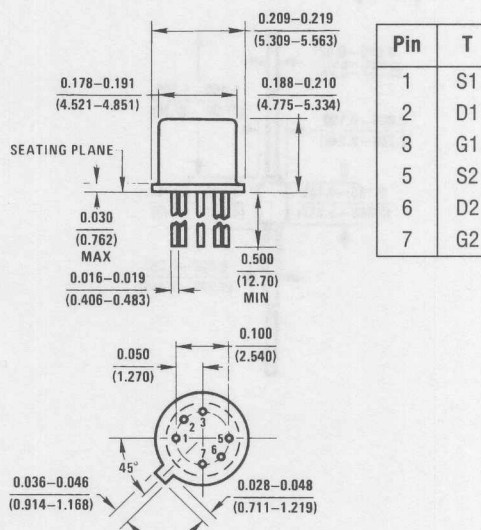
## TO-39 (17) Lo-Profile



## TO-52 (07, 18)

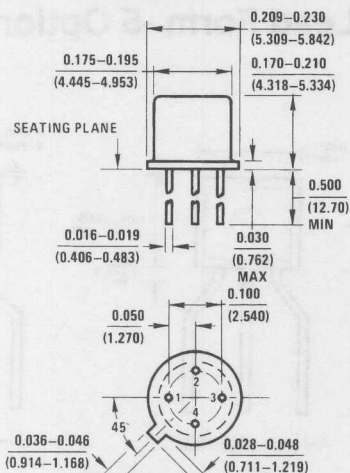


## TO-71 (08, 12)



# Package Outlines (continued)

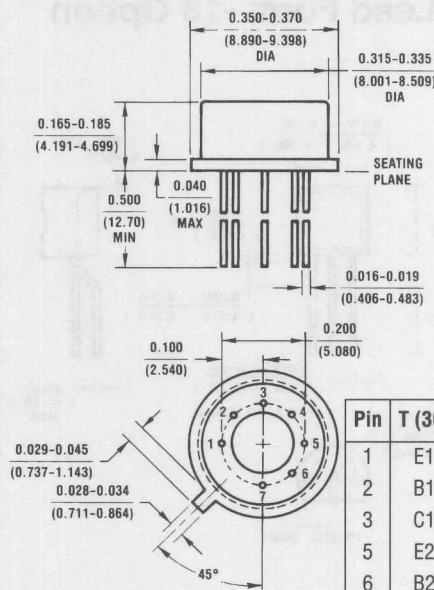
## TO-72 (23, 25, 28, 29)



Pin	T (18)	FET N(25, 29)
1	E	S
2	B	D
3	C	G
4	GND	CASE

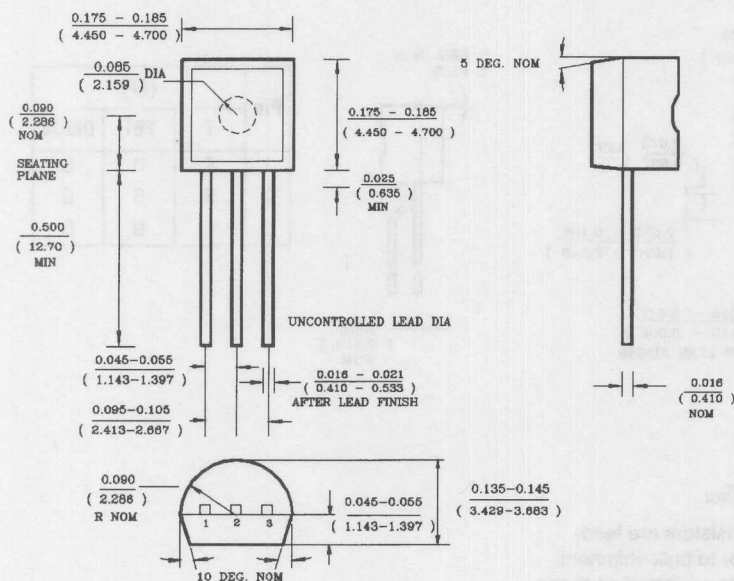
Pin	T (18)	FET P(23)
1	E	S
2	B	G
3	C	D
4	GND	CASE

## TO-78 (24, 30)



Pin	T (30)	FET(24)
1	E1	S1
2	B1	D1
3	C1	G1
5	E2	S2
6	B2	D2
7	C2	G2

## TO-92 (92, 94, 96)



Pin	(96)
	T FET
1	C G
2	E D
3	B S

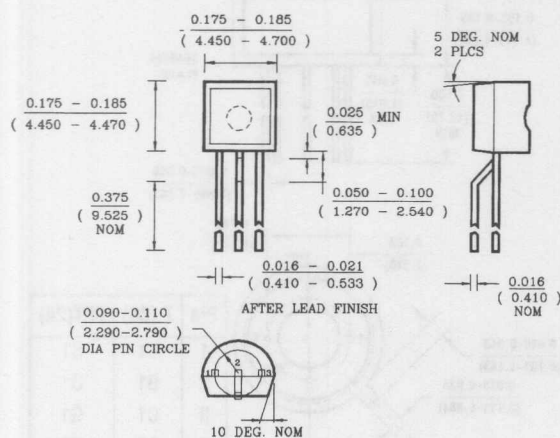
Pin	(92) STD
	T FET DMOS
1	C G S
2	B S G
3	E D D

Pin	(94)
	T FET
1	B S
2	C G
3	E D

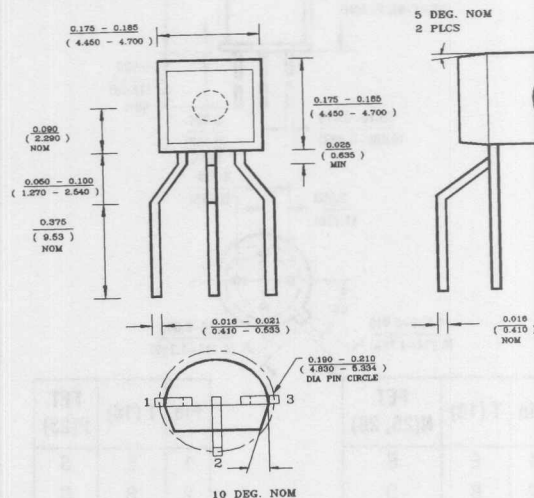


# Package Outlines (continued)

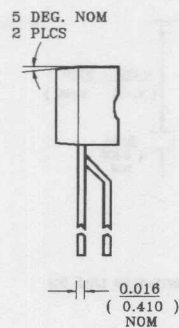
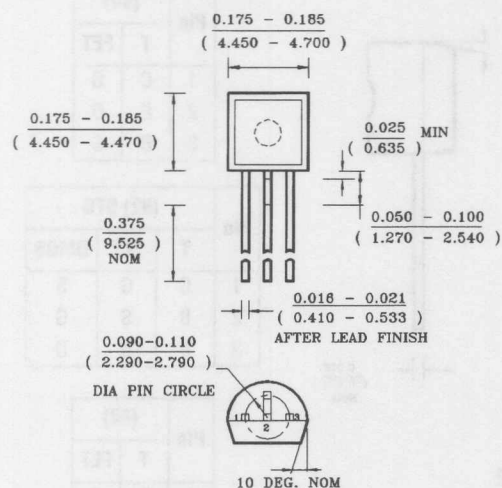
## TO-92 (92, 94, 96) TO-18 Lead Form -18 Option



## TO-92 (92, 94, 96) TO-5 Lead Form -5 Option



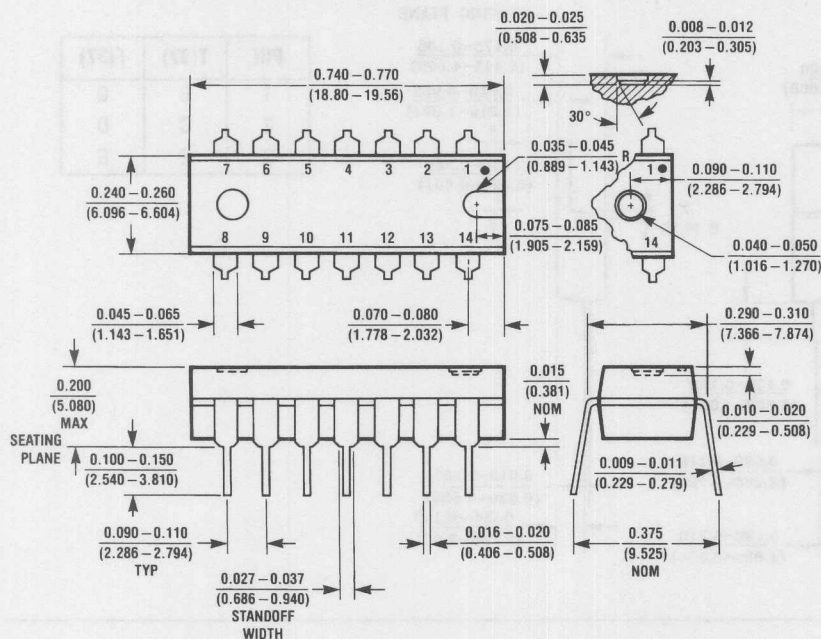
## TO-92 (97) TO-18 Lead Form STD\*



Pin	(97)		
	T	FET	DMOS
1	E	D	S
2	B	S	G
3	C	G	D

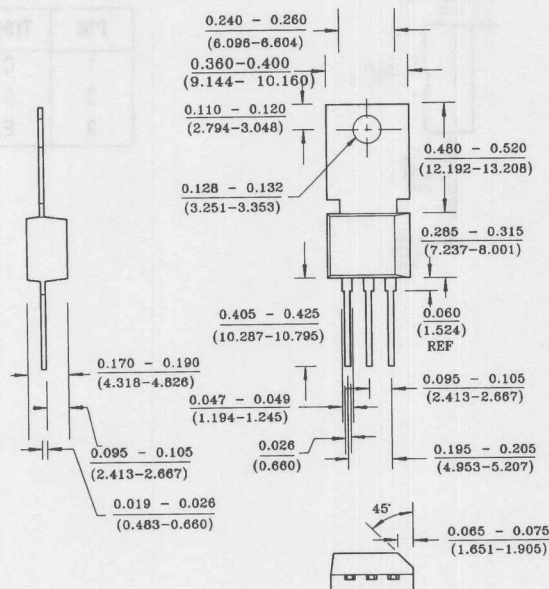
\*Note: All package 97 or 98 transistors are lead-formed to this configuration prior to bulk shipment. Order L34Z option if in-line leads preferred on these package codes.

# TO-116 (01)



Pin	T	Pin	T
1	C1	8	C3
2	B1	9	B3
3	E1	10	E3
4	NC	11	NC
5	E2	12	E4
6	B2	13	B4
7	C2	14	C4

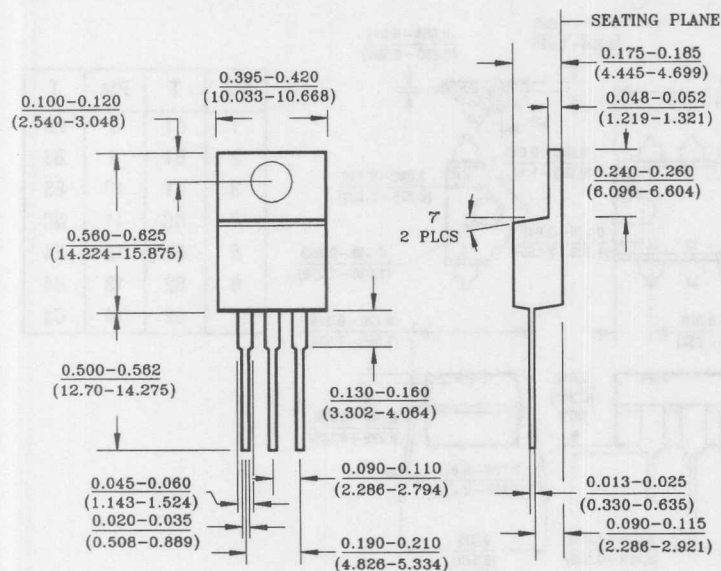
# TO-202 (51, 55, 56)



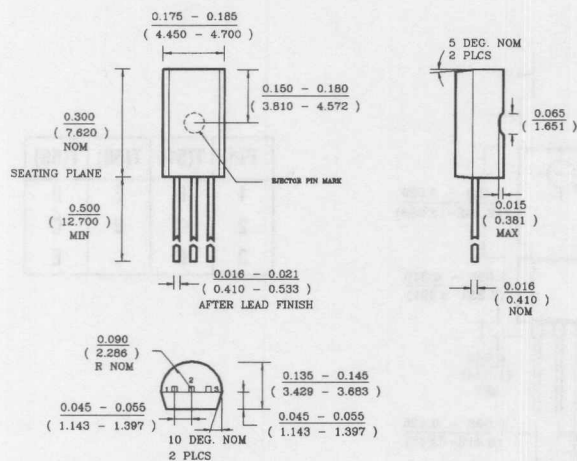
Pin	T(51)	T(55)	T(56)
1	E	E	B
2	C	B	C
3	B	C	E

# Package Outlines (continued)

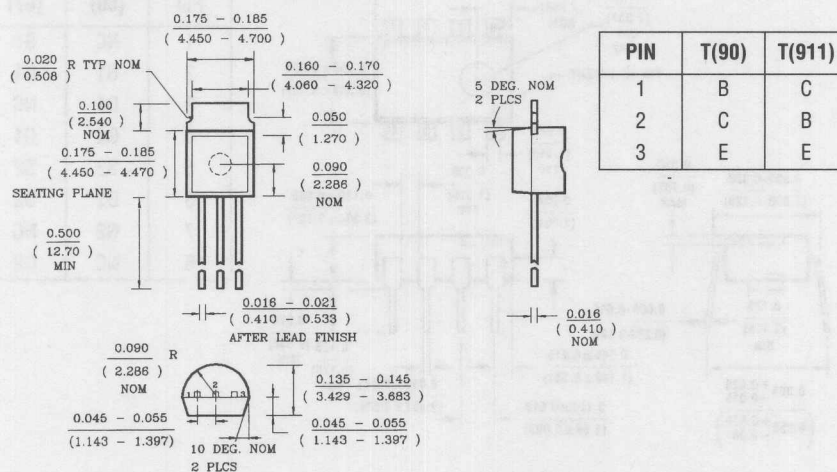
## TO-220 (37)



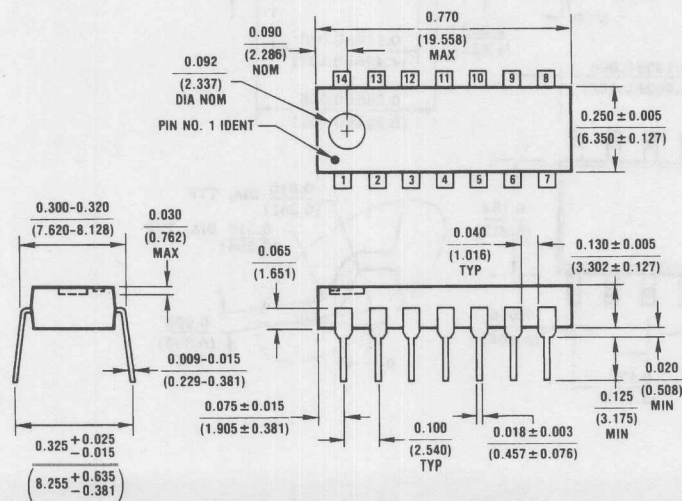
## TO-226 (99)



# TO-237 (90, 91)

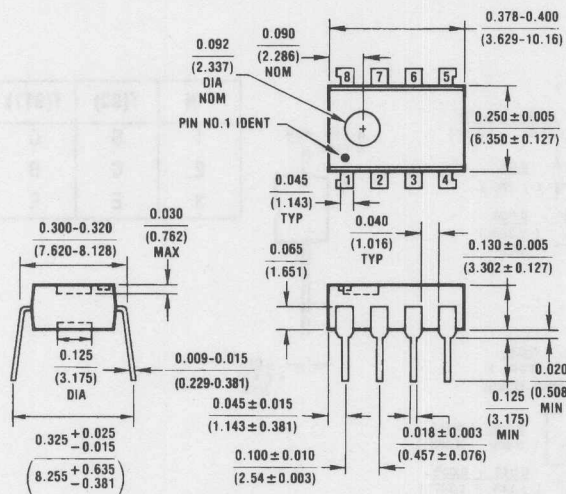


## Molded Dual-in-Line Package (39) (Diode Arrays)



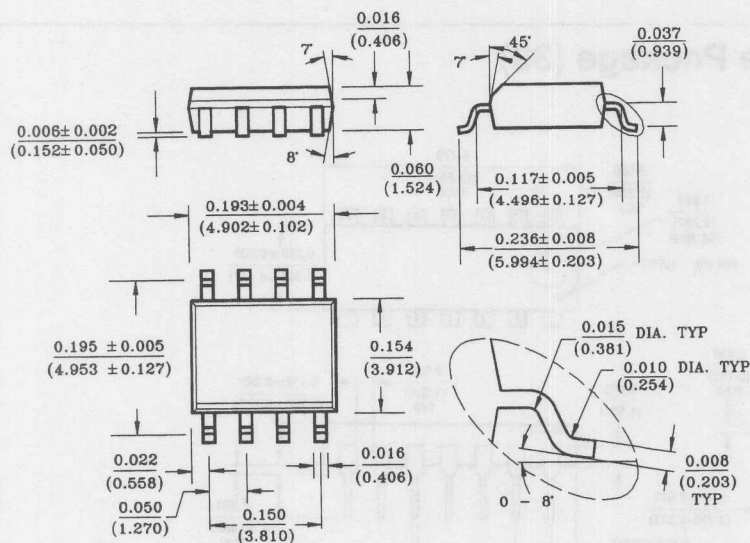
# Package Outlines (continued)

## Molded Mini-DIP (60, 67)



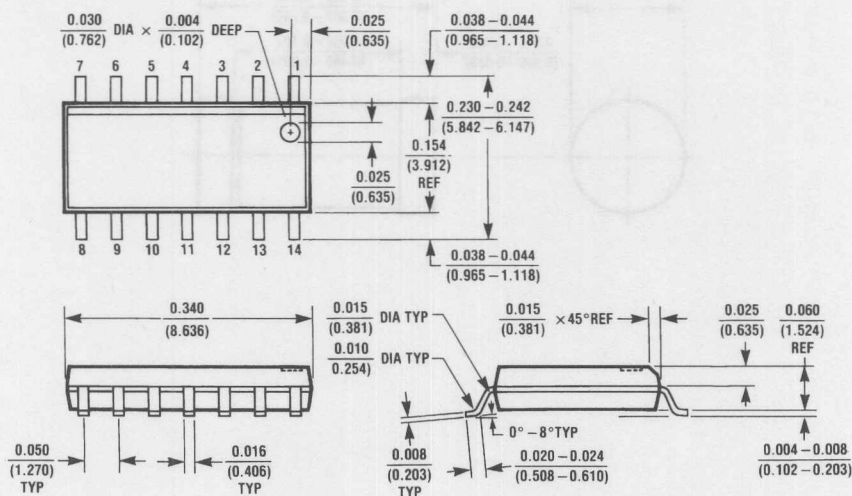
Pin	(60)	(67)
1	NC	S1
2	S1	D1
3	D1	NC
4	G1	G1
5	S2	S2
6	D2	D2
7	G2	NC
8	NC	G2

## 8-SOIC (S1)

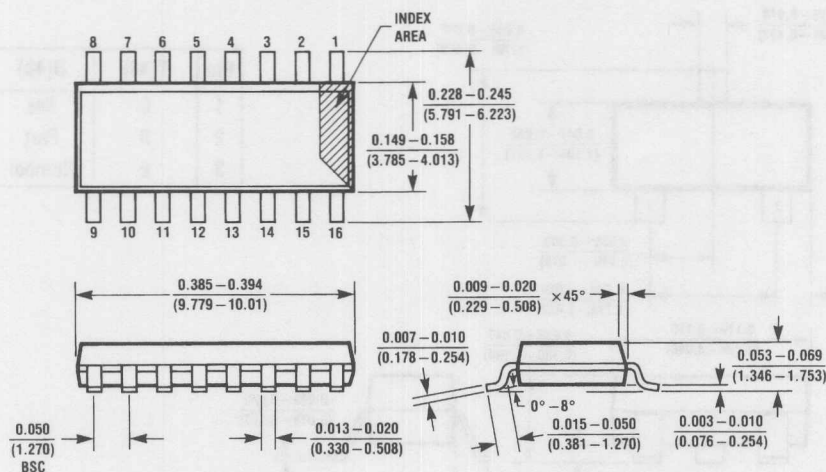




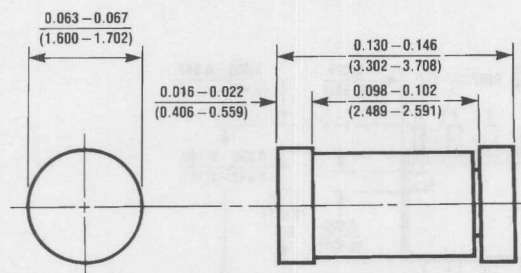
## Package Outlines (continued)

14-SOIC (S2)  
(Diode Arrays)


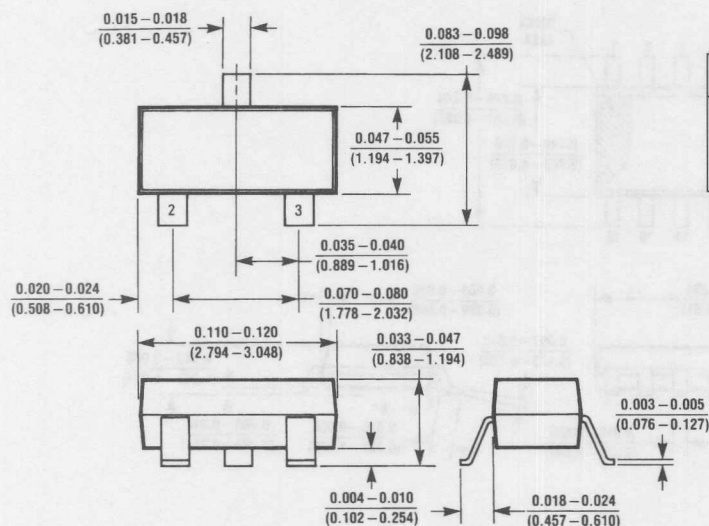
## 16-SOIC (S3)



# LL-34 (D3)



## TO-236AA (48) (SOT-23)



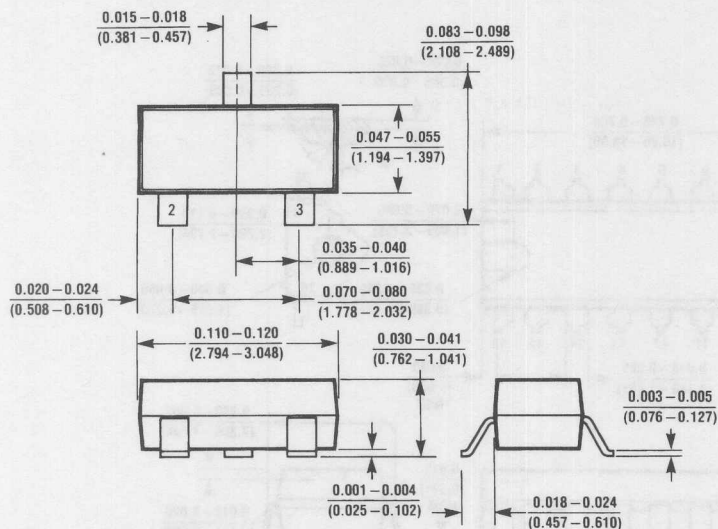
Pin	T(48)	D(48)	F(48)
1	C	See	G
2	B	Part	D
3	E	Number	S

Note 1: Meets all JEDEC dimensional requirements for TO-236AA.

Note 2: Controlling dimension: millimeters.

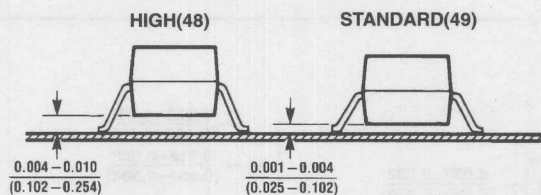
Package Outlines (continued)  
**TO-236AB (49) (SOT-23)**

Package Outlines



Pin	T(49)	D(49)	F(49)
1	C	See	G
2	B	Part	D
3	E	Number	S

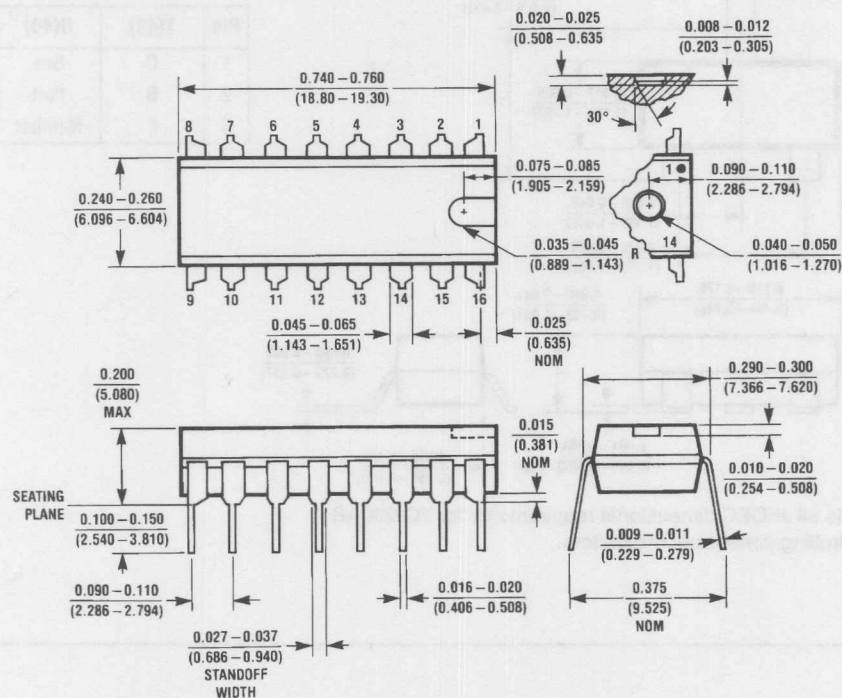
Note 1: Meets all JEDEC dimensional requirements for TO-236AB.  
 Note 2: Controlling dimension: millimeters.



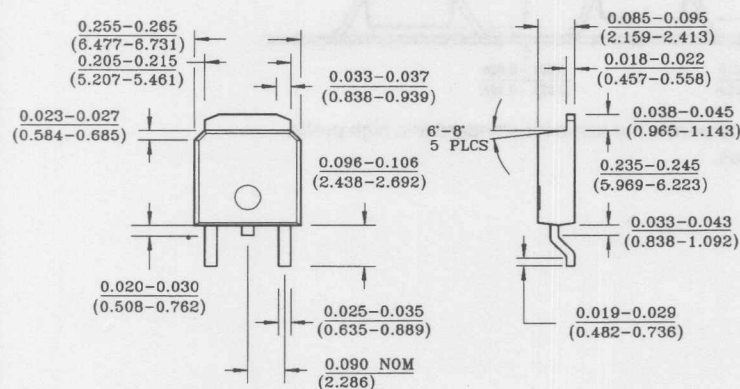
Note: Footprint is the same for standard and high profile packages.

## Package Outlines (continued)

### 16-Lead Plastic (03) (Diode Arrays)

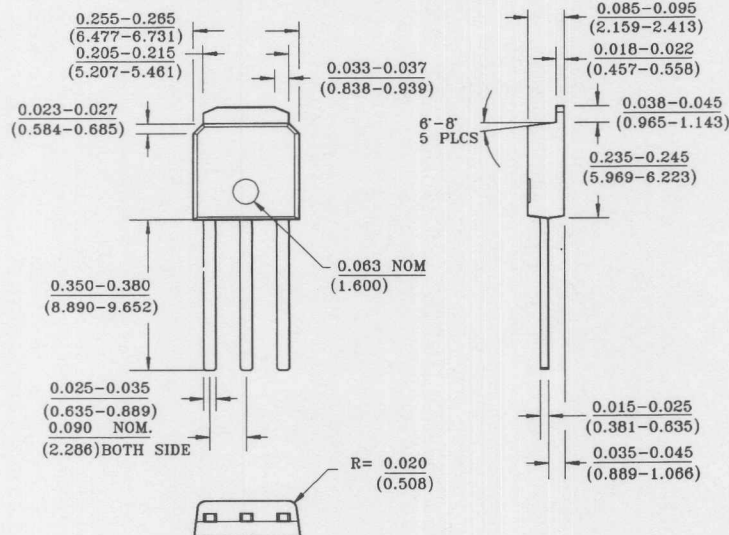


### TO-252 (D-PAK)



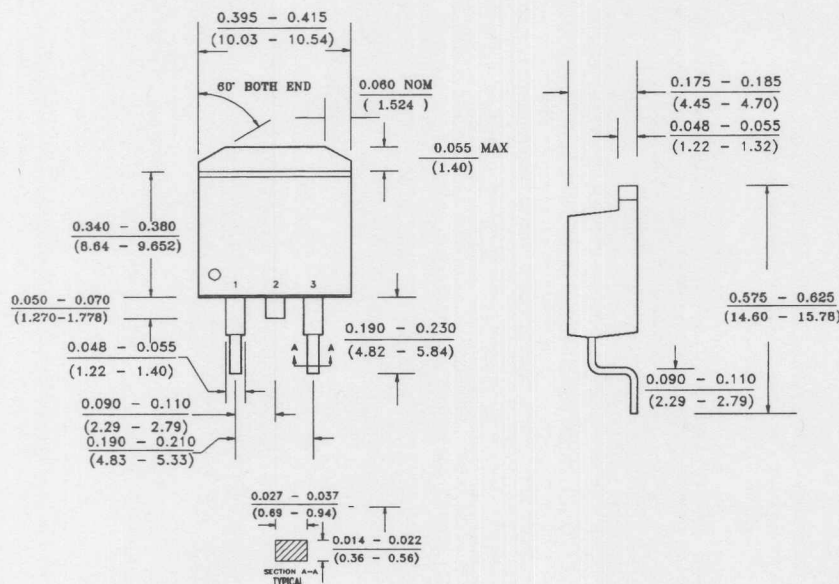
Pin	DMOS
1	G
2	D
3	S

# TO-251 (I-PAK)



Pin	DMOS
1	G
2	D
3	S

# TO-263AB



Pin	DMOS
1	G
2	D
3	S





# Cross-Reference of Devices



# Cross-Reference of Devices

Industry Part Number	Recommended National Device
1N34A	1N4454
1N34AS	1N4148
1N35	1N4454
1N36	1N4148
1N38	1N4148
1N38A	1N3070
1N38B	1N3070
1N39	1N3070
1N39A	1N3070
1N39B	1N3070
1N40	1N4148
1N41	1N4454
1N42	1N3070
1N43	1N4148
1N44	1N3070
1N45	1N4454
1N46	1N4454
1N47	1N3070
1N48	1N4454
1N49	1N4148
1N50	1N4148
1N51	1N4454
1N52	1N4454
1N52A	1N4454
1N54	1N4148
1N54A	1N4148
1N55	1N3070
1N55A	1N3070
1N55B	1N3070
1N56	1N4148
1N56A	1N4148
1N57	1N4454
1N57A	1N4454
1N58	1N3070
1N58A	1N3070
1N61	1N3070

Industry Part Number	Recommended National Device
1N62	1N3070
1N63	1N4148
1N63A	1N4148
1N64	1N4148
1N64A	1N4148
1N65	1N4454
1N66	1N4454
1N66A	1N4454
1N67	1N4148
1N67A	1N4148
1N68	1N3070
1N68A	1N3070
1N69	1N4454
1N69A	1N4454
1N70	1N3070
1N70A	1N4148
1N74	1N4148
1N75	1N3070
1N81	1N4148
1N84	1N4148
1N86	1N4148
1N87	1N4148
1N87A	1N4148
1N87S	1N4148
1N87T	1N4148
1N88	1N3070
1N89	1N4454
1N90	1N4454
1N95	1N4148
1N96	1N4447
1N96A	1N4148
1N97	1N4448
1N97A	1N4447
1N98	1N4454
1N98A	1N4448
1N99	1N4148

Industry Part Number	Recommended National Device
1N99A	1N4454
1N100	1N4447
1N100A	1N4448
1N101	1N3070
1N102	1N3070
1N103	1N4448
1N104	1N4448
1N108	1N4448
1N111	1N4148
1N112	1N4148
1N113	1N4454
1N114	1N4454
1N115	1N4454
1N116	1N4454
1N116A	1N4454
1N117	1N4454
1N117A	1N4454
1N118	1N4454
1N118A	1N4448
1N119	1N4148
1N120	1N4148
1N126	1N4148
1N126A	1N4148
1N127	1N3070
1N127A	1N3070
1N128	1N4148
1N128A	1N4148
1N132	1N4148
1N133	1N4148
1N134	1N4454
1N135	1N4148
1N139	1N4148
1N140	1N4448
1N141	1N4148
1N142	1N4938
1N143	1N4938

# Cross-Reference of Devices (continued)

Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device
1N144	1N4454	1N294A	1N4148	1N387	1N4148
1N175	1N3070	1N295	1N4148	1N388	1N4148
1N190	1N4148	1N295A	1N4148	1N389	1N4148
1N191	1N4148	1N295S	1N4148	1N390	1N4148
1N192	1N4148	1N295S	1N4148	1N391	1N4148
1N194	1N4148	1N296	1N4148	1N392	1N4148
1N194A	1N4148	1N297	1N4148	1N393	1N3070
1N195	1N4148	1N297A	1N4148	1N394	1N3070
1N196	1N4148	1N298	1N4148	1N417	1N4448
1N198	1N4148	1N298A	1N4148	1N418	1N4148
1N198A	1N4148	1N299	1N4305	1N419	FDH444
1N198B	1N4454	1N300	1N457	1N431	1N3070
1N198M	1N4148	1N300A	1N457	1N432	1N4148
1N251	1N4148	1N301	1N457	1N432A	1N4446
1N251A	1N4148	1N301A	1N457	1N432B	1N4448
1N252	1N4148	1N301B	1N457	1N433	1N3070
1N252A	1N4148	1N303	1N458	1N433A	1N3070
1N265	1N4148	1N303A	1N458A	1N433B	1N3070
1N266	1N4148	1N303B	1N458A	1N434	1N3070
1N267	1N4148	1N304	1N4148	1N434A	1N3070
1N268	1N4148	1N307	1N4938	1N434B	1N3070
1N270	FDH444	1N309	1N4148	1N435	1N4148
1N273	1N4448	1N310	1N4148	1N447	1N4448
1N276	1N4454	1N312	1N4448	1N448	1N4448
1N277	1N3070	1N313	1N4148	1N450	1N4151
1N277M	1N4448	1N314	1N4148	1N451	1N3070
1N278	1N4446	1N330	1N456A	1N452	1N4448
1N279	1N4448	1N331	1N458	1N453	1N3070
1N281	1N4448	1N350	1N457	1N454	FDH444
1N282	1N4448	1N351	1N458A	1N456	1N456A
1N283	FDH444	1N355	1N4148	1N456A	1N456A
1N287	1N4148	1N373	1N5227B	1N457	1N457
1N288	1N4148	1N375	1N5230B	1N457A	1N457A
1N289	1N4148	1N376	1N5223B	1N457M	1N457
1N290	1N3070	1N377	1N4148	1N458	1N458A
1N291	1N3070	1N378	1N5238B	1N458A	1N458A
1N292	1N4448	1N385	1N4148	1N458M	1N458A
1N294	1N4148	1N386	1N4148	1N459	1N459



# Cross-Reference of Devices (continued)

Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device
1N459A	1N459A	1N634	1N3070	1N715	1N5241B
1N459M	1N459	1N635	1N3070	1N715A	1N5241B
1N478	1N4148	1N636	1N4448	1N716	1N5242B
1N479	1N4148	1N664	1N5237B	1N716A	1N5242B
1N480	1N4148	1N665	1N5242B	1N717	1N5243B
1N483	1N483B	1N666	1N5245B	1N717A	1N5243B
1N483A	1N483B	1N667	1N5248B	1N718	1N5245B
1N483B	1N483B	1N668	1N5251B	1N718A	1N5245B
1N483C	1N4148	1N669	1N5245B	1N719	1N5246B
1N485	1N485B	1N695	1N4148	1N719A	1N5246B
1N485A	1N485B	1N695A	1N4148	1N720	1N5248B
1N485B	1N485B	1N696	1N4148	1N720A	1N5248B
1N485C	1N485B	1N698	1N4305	1N721	1N5250B
1N486B	1N486B	1N699	1N4448	1N721A	1N5250B
1N490	1N4148	1N703	1N5227B	1N722	1N5251B
1N497	1N4448	1N703A	1N5227B	1N722A	1N5251B
1N498	1N4448	1N704	1N5229B	1N723	1N5252B
1N499	1N4448	1N704A	1N5229B	1N723A	1N5252B
1N500	1N4448	1N705	1N5230B	1N724	1N5254B
1N501	1N4448	1N705A	1N5230B	1N724A	1N5254B
1N502	1N3070	1N706	1N5232B	1N725	1N5256B
1N520B	1N457	1N706A	1N5232B	1N725A	1N5256B
1N527	1N4305	1N707	1N5236B	1N726	1N5257B
1N541	1N4305	1N707A	1N5236B	1N726A	1N5257B
1N542	1N4305	1N708	1N5232B	1N746	1N5226B
1N566	1N3070	1N708A	1N5232B	1N746A	1N5226B
1N567	1N3070	1N709	1N5234B	1N747	1N5227B
1N568	1N4305	1N709A	1N5234B	1N747A	1N5227B
1N569	1N4305	1N710	1N5235B	1N748	1N5228B
1N571	FDH444	1N710A	1N5235B	1N748A	1N5228B
1N616	1N4148	1N711	1N5236B	1N749	1N5229B
1N617	1N4148	1N711A	1N5236B	1N749A	1N5229B
1N618	1N4148	1N712	1N5237B	1N750	1N5230B
1N619	1N4148	1N712A	1N5237B	1N750A	1N5230B
1N622	1N4148	1N713	1N5239B	1N751	1N5231B
1N631	1N4148	1N713A	1N5239B	1N751A	1N5231B
1N632	1N4148	1N714	1N5240B	1N752	1N5233B
1N633	1N3070	1N714A	1N5240B	1N752A	1N5233B

# Cross-Reference of Devices (continued)

Industry Part Number	Recommended National Device
1N753	1N5234B
1N753A	1N5234B
1N754	1N5235B
1N754A	1N5235B
1N755	1N5236B
1N755A	1N5236B
1N756	1N5237B
1N756A	1N5237B
1N757	1N5239B
1N757A	1N5239B
1N758	1N5240B
1N758A	1N5240B
1N759	1N5242B
1N759A	1N5242B
1N761A	1N5230B
1N762A	1N5232B
1N763A	1N5238B
1N764A	1N5238B
1N765A	1N5240B
1N766A	1N5243B
1N767A	1N5246B
1N768A	1N5249B
1N769A	1N5252B
1N771	1N4448
1N771A	FDH444
1N772	1N4448
1N772A	FDH444
1N773	1N4448
1N773A	FDH444
1N774	1N4448
1N774A	FDH444
1N775	1N4448
1N776	1N4448
1N777	1N4448
1N778	1N4148
1N779	1N3070
1N781	1N4305
1N781A	1N4305

Industry Part Number	Recommended National Device
1N788	1N4448
1N789	1N4148
1N789M	1N4148
1N790	1N4148
1N790M	1N4148
1N791	1N4448
1N791M	1N4448
1N792	1N4448
1N792M	1N4448
1N793	1N4148
1N793M	1N4148
1N794	1N4148
1N795	1N4448
1N796	1N4448
1N797	1N3070
1N798	1N3070
1N799	1N3070
1N800	1N3070
1N801	1N3070
1N802	1N3070
1N803	1N3070
1N804	1N3070
1N805	1N4148
1N806	1N4148
1N807	1N3070
1N808	1N4448
1N809	1N3070
1N810	1N4148
1N811	1N4148
1N811M	1N4148
1N812	1N4149
1N812M	1N4149
1N813	1N4148
1N813M	1N4148
1N814	1N4148
1N814M	1N4148
1N815	1N4448
1N815M	1N4448

Industry Part Number	Recommended National Device
1N817	1N3070
1N818	1N4148
1N818A	1N4148
1N835	1N4305
1N837	FDH444
1N837A	FDH444
1N838	1N3070
1N839	1N3070
1N840	FDH444
1N840M	1N3070
1N841	1N3070
1N842	1N3070
1N843	1N3070
1N844	1N3070
1N845	1N3070
1N890	1N4447
1N891	1N4448
1N892	1N4448
1N893	1N3070
1N897	1N4148
1N898	1N4448
1N899	1N3070
1N900	1N3070
1N901	1N3070
1N902	1N3070
1N903	1N4148
1N903A	1N4154
1N903AM	1N4154
1N903M	1N4154
1N904	1N4154
1N904A	1N4154
1N904AM	1N4154
1N904M	1N4154
1N905	1N4154
1N905A	1N4154
1N905AM	1N4154
1N905M	1N4154
1N906	1N4149

# Cross-Reference of Devices (continued)

Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device
1N906A	1N4447	1N948	1N4448	1N969	1N969B
1N906AM	1N4447	1N949	1N4305	1N969A	1N969B
1N906M	1N4447	1N957	1N957B	1N969B	1N969B
1N907	1N4149	1N957A	1N957B	1N970	1N970B
1N907A	1N4448	1N957B	1N957B	1N970A	1N970B
1N907AM	1N4447	1N958	1N958B	1N970B	1N970B
1N907M	1N4149	1N958A	1N958B	1N971	1N971B
1N908	1N3070	1N958B	1N958B	1N971A	1N971B
1N908A	1N4447	1N959	1N959B	1N971B	1N971B
1N908AM	1N4447	1N959A	1N959B	1N972	1N972B
1N908M	1N4149	1N959B	1N959B	1N972A	1N972B
1N909	1N4448	1N960	1N960B	1N972B	1N972B
1N910	1N4448	1N960A	1N960B	1N973	1N973B
1N911	1N4448	1N960B	1N960B	1N973A	1N973B
1N914	1N914	1N961	1N961B	1N973B	1N973B
1N914A	1N914A	1N961A	1N961B	1N993	1N4447
1N914B	1N914B	1N961B	1N961B	1N994	1N4151
1N914M	1N914	1N962	1N962B	1N995	1N4305
1N915	1N914B	1N962A	1N962B	1N997	1N4148
1N916	1N916	1N962B	1N962B	1N999	1N914
1N916A	1N916A	1N963	1N963B	1N1170	1N4148
1N916B	1N916B	1N963A	1N963B	1N1374	1N5229B
1N918	1N914	1N963B	1N963B	1N1451	1N1451
1N919	1N3070	1N964	1N964B	1N1507A	1N4730A
1N920	FDH400	1N964A	1N964B	1N1508A	1N4732A
1N921	FDH400	1N964B	1N964B	1N1509A	1N4734A
1N922	FDH400	1N965	1N965B	1N1510A	1N4736A
1N923	FDH400	1N965A	1N965B	1N1511A	1N4738A
1N924	1N483B	1N965B	1N965B	1N1512A	1N4740A
1N925	1N4148	1N966	1N966B	1N1513A	1N4742A
1N926	1N4148	1N966A	1N966B	1N1514A	1N4744A
1N927	1N4148	1N966B	1N966B	1N1515A	1N4746A
1N928	1N3070	1N967	1N967B	1N1516A	1N4748A
1N930	1N4446	1N967A	1N967B	1N1517A	1N4750A
1N931	1N3070	1N967B	1N967B	1N1518A	1N4730A
1N932	1N3070	1N968	1N968B	1N1519A	1N4732A
1N933	1N3070	1N968A	1N968B	1N1520A	1N4734A
1N934	1N3070	1N968B	1N968B	1N1521A	1N4736A

# Cross-Reference of Devices (continued)

Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device
1N1522A	1N4738A	1N3027B	1N4747A	1N3257	1N4448
1N1523A	1N4740A	1N3028B	1N4748A	1N3258	1N4448
1N1524A	1N4742A	1N3029B	1N4749A	1N3298	FDH400
1N1525A	1N4744A	1N3030B	1N4750A	1N3298A	FDH400
1N1526A	1N4746A	1N3031B	1N4751A	1N3535	1N3070
1N1527A	1N4748A	1N3032B	1N4752A	1N3536	1N457
1N1528A	1N4750A	1N3062	1N4305	1N3550	1N3070
1N1744A	1N4743A	1N3063	1N4305	1N3559	FDH444
1N1765A	1N4734A	1N3064	1N3064	1N3564	1N4448
1N1766A	1N4735A	1N3065	1N4305	1N3567	1N4448
1N1767A	1N4736A	1N3066	1N4305	1N3568	1N4448
1N1768A	1N4737A	1N3067	1N4148	1N3575	1N483B
1N1769A	1N4738A	1N3068	1N4148	1N3576	1N483B
1N1770A	1N4739A	1N3069	1N4148	1N3593	1N4148
1N1771A	1N4740A	1N3070	1N3070	1N3594	FDH600
1N1772A	1N4741A	1N3071	1N3070	1N3595	1N3595
1N1773A	1N4742A	1N3097	1N4305	1N3596	1N4448
1N1774A	1N4743A	1N3110	1N4305	1N3597	1N3070
1N1775A	1N4744A	1N3121	1N4305	1N3598	1N4152
1N1776A	1N4745A	1N3122	1N4305	1N3599	1N4938
1N1777A	1N4746A	1N3123	1N4305	1N3600	1N3600
1N1778A	1N4747A	1N3124	1N4151	1N3601	1N4149
1N1779A	1N4748A	1N3125	1N4305	1N3602	1N4151
1N1780A	1N4749A	1N3144	1N4305	1N3603	1N4151
1N1781A	1N4750A	1N3145	1N4305	1N3604	1N4151
1N1782A	1N4751A	1N3146	1N4151	1N3605	1N4152
1N1783A	1N4752A	1N3147	1N4448	1N3606	1N4153
1N3016B	1N4736A	1N3160	1N4305	1N3607	1N4151
1N3017B	1N4737A	1N3179	1N3070	1N3608	1N4152
1N3018B	1N4738A	1N3180	1N3070	1N3609	1N4153
1N3019B	1N4739A	1N3181	1N5237B	1N3625	1N3070
1N3020B	1N4740A	1N3197	1N4148	1N3638B	1N4744A
1N3021B	1N4741A	1N3203	1N4305	1N3653	FDH400
1N3022B	1N4742A	1N3204	1N4305	1N3654	1N4448
1N3023B	1N4743A	1N3206	1N4148	1N3666	1N4305
1N3024B	1N4744A	1N3215	1N4152	1N3668	1N4305
1N3025B	1N4745A	1N3223	1N3070	1N3675B	1N4736A
1N3026B	1N4746A	1N3225	1N4148	1N3676B	1N4737A



# Cross-Reference of Devices (continued)

Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device
1N3677B	1N4738A	1N4160B	1N4738A	1N4448	1N4448
1N3678B	1N4739A	1N4161B	1N4739A	1N4449	1N4448
1N3679B	1N4740A	1N4162B	1N4740A	1N4454	1N4454
1N3680B	1N4741A	1N4163B	1N4741A	1N4455	1N4305
1N3681B	1N4742A	1N4164B	1N4742A	1N4456	1N4150
1N3682B	1N4743A	1N4165B	1N4743A	1N4457	1N4150
1N3683B	1N4744A	1N4166B	1N4744A	1N4502	1N4305
1N3684B	1N4745A	1N4167B	1N4745A	1N4523	1N4305
1N3685B	1N4746A	1N4168B	1N4746A	1N4531	1N4148
1N3686B	1N4747A	1N4169B	1N4747A	1N4532	FDH600
1N3687B	1N4748A	1N4170B	1N4748A	1N4533	1N4152
1N3688B	1N4749A	1N4171B	1N4749A	1N4534	1N4153
1N3689B	1N4750A	1N4172B	1N4750A	1N4536	1N4154
1N3690B	1N4751A	1N4173B	1N4751A	1N4537	1N4151
1N3691B	1N4752A	1N4244	1N4244	1N4548	1N4154
1N3864	1N458	1N4305	1N4305	1N4608	FDH400
1N3865	1N4148	1N4323B	1N4736A	1N4610	1N4150
1N3872	FDH444	1N4324B	1N4737A	1N4728A	1N4728A
1N3873	FDH444	1N4325B	1N4738A	1N4729A	1N4729A
1N3944	1N4305	1N4326B	1N4739A	1N4730A	1N4730A
1N3952	1N3070	1N4327B	1N4740A	1N4731A	1N4731A
1N3953	1N4148	1N4328B	1N4741A	1N4732A	1N4732A
1N3954	1N4150	1N4329B	1N4742A	1N4733A	1N4733A
1N3956	1N4305	1N4330B	1N4743A	1N4734A	1N4734A
1N3991	1N4305	1N4331B	1N4744A	1N4735A	1N4735A
1N4008	1N4305	1N4332B	1N4745A	1N4736A	1N4736A
1N4043	1N4154	1N4333B	1N4746A	1N4737A	1N4737A
1N4086	FDH444	1N4334B	1N4747A	1N4738A	1N4738A
1N4088	1N4148	1N4335B	1N4748A	1N4739A	1N4739A
1N4147	1N914	1N4336B	1N4749A	1N4740A	1N4740A
1N4148	1N4148	1N4337B	1N4750A	1N4741A	1N4741A
1N4149	1N4149	1N4338B	1N4751A	1N4742A	1N4742A
1N4150	1N4150	1N4339B	1N4752A	1N4743A	1N4743A
1N4152	1N4152	1N4376	1N4376	1N4744A	1N4744A
1N4153	1N4153	1N4443	1N4148	1N4745A	1N4745A
1N4154	1N4154	1N4445	1N4151	1N4746A	1N4746A
1N4158B	1N4736A	1N4446	1N4446	1N4747A	1N4747A
1N4159B	1N4737A	1N4447	1N4447	1N4748A	1N4748A



# Cross-Reference of Devices (continued)

Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device
1N4749A	1N4749A	1N5242B	1N5242B	1N5428	1N3070
1N4750A	1N4750A	1N5243A	1N5243B	1N5430	FDH400
1N4751A	1N4751A	1N5243B	1N5243B	1N5431	FDH400
1N4752A	1N4752A	1N5244A	1N5244B	1N5432	FD777
1N4938	1N4938	1N5244B	1N5244B	1N5449	1N485B
1N5226A	1N5226B	1N5245A	1N5245B	1N5559B	1N4736A
1N5226B	1N5226B	1N5245B	1N5245B	1N5560B	1N4737A
1N5227A	1N5227B	1N5246A	1N5246B	1N5561B	1N4738A
1N5227B	1N5227B	1N5246B	1N5246B	1N5562B	1N4739A
1N5228A	1N5228B	1N5247A	1N5247B	1N5563B	1N4740A
1N5228B	1N5228B	1N5247B	1N5247B	1N5564B	1N4741A
1N5229A	1N5229B	1N5248A	1N5248B	1N5565B	1N4742A
1N5229B	1N5229B	1N5248B	1N5248B	1N5566B	1N4743A
1N5230A	1N5230B	1N5249A	1N5249B	1N5567B	1N4744A
1N5230B	1N5230B	1N5249B	1N5249B	1N5568B	1N4745A
1N5231A	1N5231B	1N5250A	1N5250B	1N5569B	1N4746A
1N5231B	1N5231B	1N5250B	1N5250B	1N5570B	1N4747A
1N5232A	1N5232B	1N5251A	1N5251B	1N5571B	1N4748A
1N5232B	1N5232B	1N5251B	1N5251B	1N5572B	1N4749A
1N5233A	1N5233B	1N5252A	1N5252B	1N5573B	1N4750A
1N5233B	1N5233B	1N5252B	1N5252B	1N5574B	1N4751A
1N5234A	1N5234B	1N5253A	1N5253B	1N5575B	1N4752A
1N5234B	1N5234B	1N5253B	1N5253B	1N5913B	1N4728A
1N5235A	1N5235B	1N5254A	1N5254B	1N5914B	1N4729A
1N5235B	1N5235B	1N5254B	1N5254B	1N5915B	1N4730A
1N5236A	1N5236B	1N5255A	1N5255B	1N5916B	1N4731A
1N5236B	1N5236B	1N5255B	1N5255B	1N5917B	1N4732A
1N5237A	1N5237B	1N5256A	1N5256B	1N5918B	1N4733A
1N5237B	1N5237B	1N5256B	1N5256B	1N5919B	1N4734A
1N5238A	1N5238B	1N5257A	1N5257B	1N5920B	1N4735A
1N5238B	1N5238B	1N5257B	1N5257B	1N5921B	1N4736A
1N5239A	1N5239B	1N5282	1N5282	1N5922B	1N4737A
1N5239B	1N5239B	1N5315	1N4153	1N5923B	1N4738A
1N5240A	1N5240B	1N5316	1N4153	1N5924B	1N4739A
1N5240B	1N5240B	1N5317	1N4150	1N5925B	1N4740A
1N5241A	1N5241B	1N5318	1N4150	1N5926B	1N4741A
1N5241B	1N5241B	1N5319	1N4350	1N5927B	1N4742A
1N5242A	1N5242B	1N5427	1N4148	1N5928B	1N4743A

# Cross-Reference of Devices (continued)

Industry Part Number	Recommended National Device
1N5929B	1N4744A
1N5930B	1N4745A
1N5931B	1N4746A
1N5932B	1N4747A
1N5933B	1N4748A
1N5934B	1N4749A
1N5935B	1N4750A
1N5936B	1N4751A
1N5937B	1N4752A
1N5988A	1N5226B
1N5988B	1N5226B
1N5989A	1N5227B
1N5989B	1N5227B
1N5990A	1N5228B
1N5990B	1N5228B
1N5991A	1N5229B
1N5991B	1N5229B
1N5992A	1N5230B
1N5992B	1N5230B
1N5993A	1N5231B
1N5993B	1N5231B
1N5994A	1N5232B
1N5994B	1N5232B
1N5995A	1N5234B
1N5995B	1N5234B
1N5996A	1N5235B
1N5996B	1N5235B
1N5997A	1N5236B
1N5997B	1N5236B
1N5998A	1N5237B
1N5998B	1N5237B
1N5999A	1N5239B
1N5999B	1N5239B
1N6000A	1N5240B
1N6000B	1N5240B
1N6001A	1N5241B
1N6001B	1N5241B
1N6002A	1N5242B

Industry Part Number	Recommended National Device
1N6002B	1N5242B
1N6003A	1N5243B
1N6003B	1N5243B
1N6004A	1N5245B
1N6004B	1N5245B
1N6005A	1N5246B
1N6005B	1N5246B
1N6006A	1N5248B
1N6006B	1N5248B
1N6007A	1N5250B
1N6007B	1N5250B
1N6008A	1N5251B
1N6008B	1N5251B
1N6009A	1N5252B
1N6009B	1N5252B
1N6010A	1N5254B
1N6010B	1N5254B
1N6011A	1N5256B
1N6011B	1N5256B
1N6012A	1N5257B
1N6012B	1N5257B
1N6099	1N6099
1S920	1S920
1S921	1S921
1S922	1S922
1S923	1S923
2N669B	2N3019
2N696	2N2219A
2N697	2N2219A
2N699	2N3019
2N699A	2N3019
2N706	2N2369
2N706C	2N2369
2N708	2N708
2N709	2N2369A
2N721A	2N2907
2N722A	2N2907
2N730	2N2222A

Industry Part Number	Recommended National Device
2N734	2N2484
2N734A	2N2484
2N735	2N2484
2N735A	2N2484
2N736	2N2484
2N736A	2N2484
2N736B	2N2484
2N742	2N2484
2N742A	2N2484
2N744	2N2369A
2N744A	2N2369A
2N756A	2N2484
2N757A	2N2484
2N758A	2N2484
2N758B	2N2484
2N759A	2N2484
2N759B	2N2484
2N834A	2N2369A
2N847	2N2369A
2N850	2N2369A
2N852	2N2369A
2N858	2N2907
2N859	2N2907
2N860	2N2907
2N861	2N2907
2N862	2N2907
2N863	2N2907
2N864	2N2369A
2N864A	2N2369A
2N865	2N2907
2N865A	2N2907
2N867	2N2907
2N869	2N4209
2N869A	2N4209
2N914	2N2369A
2N914A	2N2369A
2N918	2N918
2N923	2N2907

# Cross-Reference of Devices (continued)

Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device
2N924	2N2907	2N1335	2N2219A	2N1613	2N2219A
2N925	2N2907	2N1336	2N2219A	2N1613B	2N3019
2N926	2N2907	2N1337	2N2219A	2N1623	2N2907
2N927	2N2907	2N1338	2N2219A	2N1704	2N2219A
2N928	2N2907	2N1339	2N3019	2N1711	2N2219A
2N929	2N930	2N1340	2N3019	2N1711A	2N2219A
2N929A	2N2484	2N1341	2N3019	2N1711B	2N2219A
2N930	2N930	2N1342	2N3019	2N1764	2N2369A
2N930A	2N2484	2N1369	2N2907	2N1837	2N2219A
2N930B	2N2484	2N1386	2N2222	2N1837A	2N2219A
2N935	2N2907	2N1387	2N2222	2N1837B	2N2219A
2N936	2N2907	2N1388	2N2222	2N1838	2N2219A
2N937	2N2907	2N1389	2N2222	2N1840	2N2219A
2N938	2N2907	2N1390	2N2222	2N1890	2N3019
2N939	2N2907	2N1439	2N2907A	2N1893	2N3019
2N940	2N2907	2N1440	2N2907A	2N1923	2N3019
2N941	2N2907	2N1441	2N2907A	2N1941	2N2219A
2N942	2N2907	2N1442	2N2907A	2N1943	2N2219A
2N943	2N2907	2N1443	2N2907A	2N1944	2N2219A
2N944	2N2907	2N1474	2N2907A	2N1945	2N2219A
2N945	2N2907	2N1474A	2N2907A	2N1946	2N2219A
2N946	2N2907	2N1475	2N2907A	2N1953	2N2219A
2N958	2N2369A	2N1491	2N2219A	2N1990	2N3019
2N959	2N2369A	2N1492	2N2219A	2N2017	2N3019
2N1051	2N2219A	2N1505	2N2219A	2N2033	2N3019
2N1074	2N2219A	2N1506	2N2219A	2N2038	2N3053
2N1075	2N2219A	2N1506A	2N2219A	2N2039	2N3019
2N1076	2N2219A	2N1507	2N2219A	2N2040	2N3053
2N1077	2N2219A	2N1508	2N3019	2N2041	2N3019
2N1105	2N3019	2N1509	2N3019	2N2049	2N2219A
2N1117	2N3019	2N1528	2N2219A	2N2086	2N3019
2N1206	2N3019	2N1564	2N3019	2N2087	2N3019
2N1267	2N2369A	2N1565	2N3019	2N2102	2N3019
2N1268	2N2369A	2N1566	2N3019	2N2106	2N3019
2N1269	2N2369A	2N1566A	2N3019	2N2107	2N3019
2N1270	2N2369A	2N1572	2N3019	2N2108	2N3019
2N1271	2N2369A	2N1573	2N3019	2N2193	2N3019
2N1272	2N2369A	2N1574	2N3019	2N2193A	2N3019

# Cross-Reference of Devices (continued)

Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device
2N2194	2N2219A	2N2380	2N2219A	2N2904	2N2904
2N2194A	2N2219A	2N2380A	2N2219A	2N2904A	2N2904A
2N2194B	2N2219A	2N2389	2N2219A	2N2905	2N2905
2N2195	2N2219A	2N2395	2N2219A	2N2905A	2N2905A
2N2195B	2N2219A	2N2396	2N2219A	2N2906	2N2907
2N2198	2N3019	2N2397	2N2219A	2N2906A	2N2907A
2N2206	2N2369A	2N2405	2N2405	2N2907	2N2907
2N2217	2N2219A	2N2433	2N2219A	2N2907A	2N2907A
2N2218	2N2219A	2N2435	2N3019	2N2926	2N2925
2N2218A	2N2219A	2N2436	2N3019	2N2938	2N2369A
2N2219	2N2219A	2N2437	2N3019	2N2939	2N3019
2N2219A	2N2219A	2N2438	2N3019	2N2940	2N3019
2N2220	2N2222	2N2439	2N3019	2N2951	2N2219A
2N2221	2N2222	2N2440	2N3019	2N2959	2N2219A
2N2221A	2N2222A	2N2475	2N2369A	2N2960	2N2219A
2N2222	2N2222	2N2478	2N2219A	2N2961	2N2219A
2N2222A	2N2222A	2N2479	2N2219A	2N3011	2N2369
2N2222B	2N2222A	2N2484	2N2484	2N3012	2N2369
2N2236	2N2219A	2N2484	2N2484	2N3014	2N2369
2N2237	2N2219A	2N2486	2N2484	2N3019	2N3019
2N2240	2N2219A	2N2601	2N2907A	2N3020	2N3019
2N2241	2N2219A	2N2602	2N2907A	2N3053	2N3053
2N2243	2N3019	2N2603	2N2907A	2N3053A	2N3019
2N2243A	2N3019	2N2608	2N2608	2N3056	2N3019
2N2270	2N2270	2N2695	2N2907	2N3057	2N3019
2N2272	2N2222	2N2709	2N2907	2N3057A	2N3019
2N2297	2N2219A	2N2711	2N2925	2N3073	2N2907A
2N2309	2N2219A	2N2712	2N2925	2N3077	2N2484
2N2310	2N3019	2N2713	2N2925	2N3081	2N3019
2N2312	2N3019	2N2714	2N2925	2N3095	2N2907A
2N2316	2N3019	2N2787	2N2219A	2N3107	2N3019
2N2317	2N2219A	2N2788	2N2219A	2N3108	2N3019
2N2350	2N2222A	2N2789	2N2219A	2N3109	2N3019
2N2350A	2N2222A	2N2792	2N2222A	2N3115	2N2222A
2N2364	2N3019	2N2837	2N2907A	2N3116	2N2222A
2N2364A	2N3019	2N2863	2N2219A	2N3117	2N3117
2N2369	2N2369	2N2864	2N2219A	2N3119	2N3019
2N2369A	2N2369A	2N2886	2N2219A	2N3122	2N2219A



# Cross-Reference of Devices (continued)

Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device
2N3123	2N2219A	2N3437	2N3684	2N3642	PN3642
2N3133	2N2907	2N3438	2N4339	2N3643	2N4401
2N3134	2N2907	2N3439	2N3440	2N3644	PN3644
2N3135	2N2907	2N3440	2N3440	2N3645	PN3645
2N3136	2N2907	2N3451	2N4208	2N3647	2N2369
2N3227	2N2369	2N3458	2N3822	2N3663	2N3663
2N3241	2N2222	2N3459	2N4340	2N3663	2N3663
2N3242	2N2222	2N3460	2N4339	2N3671	2N2905A
2N3244	2N3467	2N3464	2N2219A	2N3672	2N2907A
2N3246	2N2484	2N3467	2N3467	2N3673	2N2907A
2N3247	2N2484	2N3468	2N3467	2N3678	2N2219A
2N3248	PN3640	2N3485	2N2907	2N3684	2N3684
2N3249	PN3640	2N3485A	2N2907A	2N3686	2N3686
2N3250	2N2907	2N3486	2N2907A	2N3700	2N3700
2N3250A	2N2907A	2N3486A	2N2907	2N3702	2N3702
2N3299	2N2219A	2N3503	2N2905A	2N3704	2N3704
2N3301	2N2222A	2N3505	2N2907A	2N3724	2N3724
2N3302	2N2222A	2N3508	2N2369A	2N3725	2N3725
2N3330	2N2608	2N3509	2N2369A	2N3734	2N3724
2N3331	2N2608	2N3545	2N2907A	2N3735	2N3725
2N3341	2N2907A	2N3546	2N4208	2N3742	2N6719
2N3350	2N2907A	2N3548	2N3962	2N3819	2N3819
2N3351	2N2907A	2N3549	2N3962	2N3820	2N3820
2N3352	2N2907A	2N3563	PN3563	2N3822	2N3822
2N3374	2N3019	2N3566	PN3566	2N3823	2N4416
2N3391A	2N3391A	2N3567	PN3567	2N3825	2N4400
2N3392	2N3392	2N3569	PN3569	2N3830	2N2219A
2N3393	2N3393	2N3576	2N4209	2N3831	2N2219A
2N3394	2N3393	2N3605	PN2369	2N3843	2N3903
2N3395	2N3392	2N3605A	PN2369	2N3843A	2N3903
2N3396	2N3392	2N3606	PN2369	2N3844	2N3903
2N3397	2N3393	2N3606A	PN2369A	2N3844A	2N3903
2N3398	2N3393	2N3607	PN2369A	2N3845	2N3903
2N3402	2N3393	2N3638	PN3638	2N3845A	2N3903
2N3415	2N3415	2N3638A	PN3638A	2N3854	2N3903
2N3416	2N3416	2N3639	PN3640	2N3854A	2N3903
2N3417	2N3417	2N3640	PN3640	2N3855	2N3903
2N3436	2N3822	2N3641	PN3642	2N3855A	2N3903



# Cross-Reference of Devices (continued)

Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device
2N3856	2N3904	2N4062	MPS6518	2N4340	2N4340
2N3856	2N3904	2N4086	MPS6514	2N4354	PN4355
2N3858A	2N5550	2N4087	MPS6514	2N4355	PN4356
2N3859A	2N5550	2N4087A	MPS6515	2N4356	PN4355
2N3877	2N5550	2N4091	2N4091	2N4391	2N4391
2N3901	2N5088	2N4092	2N4092	2N4392	2N4392
2N3903	2N3903	2N4093	2N4093	2N4393	2N4393
2N3904	2N3904	2N4117	2N4117A	2N4400	2N4400
2N3905	2N3905	2N4117A	2N4117A	2N4401	2N4401
2N3906	2N3906	2N4118	2N4118	2N4402	2N4402
2N3917	2N3917	2N4118A	2N4118A	2N4403	2N4403
2N3955	2N3955	2N4121	PN4121	2N4404	2N4033
2N3956	2N3956	2N4122	PN4122	2N4404	2N4032
2N3958	2N3958	2N4123	2N4123	2N4405	2N4033
2N3962	2N3962	2N4124	2N4124	2N4406	2N4033
2N3966	2N4392	2N4125	2N4125	2N4407	2N4033
2N3967	2N3684	2N4126	2N4126	2N4410	2N4410
2N3967A	2N3684	2N4140	2N4400	2N4416	2N4416
2N3968	2N3686	2N4141	PN4141	2N4416A	2N4416A
2N3968A	2N3686	2N4142	2N4402	2N4418	PN2369A
2N3969	2N3686	2N4143	PN4143	2N4419	PN2369A
2N3969A	2N3686	2N4207	2N4208	2N4420	PN2369A
2N3970	2N4391	2N4208	2N4208	2N4421	PN2369A
2N3971	2N4392	2N4209	2N4209	2N4422	PN2369A
2N3972	2N4393	2N4227	2N4400	2N4423	PN2369
2N3973	2N4400	2N4228	2N4402	2N4424	2N4424
2N3974	2N4400	2N4234	2N4234	2N4449	2N2369A
2N3975	2N4401	2N4256	2N3904	2N4450	2N2222
2N3976	2N4401	2N4274	PN4275	2N4452	2N2907
2N3981	2N2219A	2N4284	2N5087	2N4856	2N4856
2N3982	2N2219A	2N4285	2N5087	2N4856A	2N4391
2N4008	2N4037	2N4286	MPS6515	2N4857	2N4857
2N4030	2N4032	2N4287	2N3859A	2N4857A	2N4391
2N4031	2N4033	2N4288	MPS6518	2N4858	2N4858
2N4032	2N4032	2N4294	PN2369A	2N4858A	2N4392
2N4033	2N4033	2N4295	PN2369	2N4859	2N4859
2N4036	2N4036	2N4338	2N4338	2N4859A	2N4391
2N4037	2N4037	2N4339	2N4339	2N4860	2N4860

# Cross-Reference of Devices (continued)

Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device
2N4860A	2N4391	2N5107	2N2222	2N5320	2N5320
2N4861	2N4861	2N5114	2N5018	2N5322	2N5322
2N4861A	2N4392	2N5115	2N5115	2N5323	2N5323
2N4867	2N4339	2N5116	2N5116	2N5354	2N5366
2N4872	2N4208	2N5134	PN5134	2N5355	2N5366
2N4873	2N2369A	2N5135	PN2222	2N5358	2N3684
2N4888	2N5401	2N5136	PN2222	2N5359	2N3684
2N4916	PN4917	2N5137	PN2222	2N5360	2N3684
2N4917	PN4917	2N5138	PN5138	2N5361	2N3684
2N4943	2N3019	2N5139	PN4917	2N5365	2N5366
2N4944	PN3567	2N5140	PN3640	2N5366	2N5366
2N4951	2N2222	2N5141	PN3640	2N5368	2N4400
2N4952	2N2222	2N5142	PN2907	2N5369	2N4401
2N4953	2N2222	2N5143	PN2907	2N5371	2N4400
2N4954	2N2222	2N5172	2N5172	2N5372	2N4402
2N4964	2N5087	2N5175	2N5550	2N5373	2N4403
2N4966	PN2484	2N5179	2N5179	2N5375	2N4402
2N4967	PN2484	2N5186	2N2369	2N5380	2N3903
2N4968	PN3565	2N5209	2N5210	2N5381	2N3904
2N4969	2N4400	2N5210	2N5210	2N5382	2N3905
2N4970	2N4401	2N5219	2N3904	2N5383	2N3906
2N4971	2N4402	2N5220	MPS6531	2N5397	2N5397
2N4972	2N4403	2N5221	MPS3702	2N5400	2N5400
2N5018	2N5018	2N5223	MPS6521	2N5401	2N5401
2N5019	2N5019	2N5224	PN2369	2N5415	2N5415
2N5020	2N5019	2N5225	2N4401	2N5418	2N4400
2N5026A	MPSA14	2N5226	2N4402	2N5419	2N4401
2N5030	PN2369A	2N5227	PN4249	2N5420	PN3566
2N5055	PN4258	2N5228	PN3640	2N5432	2N5432
2N5056	2N4209	2N5245	2N5245	2N5433	2N5433
2N5057	2N4209	2N5246	2N5246	2N5434	2N5434
2N5086	2N5087	2N5247	2N5247	2N5447	MPS3702
2N5087	2N5087	2N5307	2N5307	2N5448	MPS3703
2N5088	2N5088	2N5308	2N5308	2N5449	MPS3704
2N5089	2N5089	2N5308A	MPSA14	2N5450	MPS3704
2N5103	2N3684	2N5309	2N5210	2N5457	2N5457
2N5104	2N3684	2N5310	2N5210	2N5458	2N5458
2N5106	2N2219A	2N5311	2N5210	2N5459	2N5459

# Cross-Reference of Devices (continued)

Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device
2N5460	2N5460	2N5827	MPS6515	2N6709	2N6728
2N5461	2N5461	2N5830	2N5830	2N6710	2N6732
2N5462	2N5462	2N5831	2N5551	2N6714	2N6714
2N5484	2N5484	2N5855	MPSA55	2N6715	2N6715
2N5485	2N5485	2N5857	MPSA56	2N6716	2N6716
2N5486	2N5486	2N5861	2N3019	2N6717	2N6717
2N5525	MPSA13	2N5864	2N4033	2N6718	2N6718
2N5550	2N5550	2N5865	2N4032	2N6719	2N6719
2N5551	2N5551	2N5906	2N5906	2N6724	2N6724
2N5555	2N5555	2N5908	2N5908	2N6725	2N6725
2N5556	2N4393	2N5909	2N5909	2N6726	2N6726
2N5557	2N4393	2N5911	2N5911	2N6727	2N6727
2N5558	2N4393	2N5912	2N5912	2N6728	2N6728
2N5564	2N5564	2N5949	2N5949	2N6729	2N6729
2N5565	2N5565	2N5950	2N5950	2N6730	2N6730
2N5566	2N5566	2N5951	2N5951	2N6731	2N6731
2N5592	2N3822	2N5952	2N5952	2N6732	2N6732
2N5593	2N3822	2N5953	2N5953	2N7000	2N7000
2N5594	2N3822	2N5961	2N5961	2N7002	2N7002
2N5638	2N5638	2N5962	2N5962	2N7008	2N7000
2N5653	2N5638	2N5999	2N5087	2N7051	2N7051
2N5654	2N5639	2N6000	2N4401	2N7053	2N7053
2N5679	2N5679	2N6001	2N4402	2SK108	PN4392
2N5680	2N5680	2N6004	2N4402	2SK109	U403
2N5682	2N5682	2N6009	2N5087	2SK113	2N4393
2N5763	2N2907A	2N6010	2N4401	2SK117	2N4340
2N5769	PN2369A	2N6011	2N4402	2SK118	2N4340
2N5770	2N5770	2N6021	D45H8	2SK119	2N4340
2N5771	2N5771	2N6427	2N6427	2SK120	2N5484
2N5772	2N5772	2N6485	2N6485	2SK121	J211
2N5814	2N3903	2N6548	2N6548	2SK123	MMBFJ201
2N5815	2N3904	2N6549	2N6549	2SK125	J310
2N5816	2N3904	2N6551	2N6551	2SK13	2N4340
2N5817	2N3905	2N6553	2N6553	2SK148	2N5485
2N5818	2N3906	2N6554	2N6554	2SK149	J309
2N5819	2N3906	2N6555	2N6555	2SK150	U403
2N5821	MPSA55	2N6706	2N6716	2SK154	2N5485
2N5826	MPS6514	2N6707	2N6707	2SK155	J309



# Cross-Reference of Devices (continued)

Industry Part Number	Recommended National Device
2SK156A	PN4117A
2SK156B	PN4117A
2SK156C	PN4117A
2SK157	MMBFJ202
2SK158	MMBFJ202
2SK160	MMBFJ202
2SK163	J113
2SK165	J309
2SK168D	2N5485
2SK168E	J304
2SK168F	2N5486
2SK185	2N5486
2SK192ABL	2N5486
2SK192AGR	2N5484
2SK192AY	2N5484
2SK193EF	2N5484
2SK193FF	2N5484
2SK193KF	2N5484
2SK193LF	2N5484
2SK193MF	2N5485
2SK193PF	2N5484
2SK193UF	J201
2SK195F	2N5484
2SK195H	2N5484
2SK195J	2N5485
2SK197C	MMBFJ202
2SK197D	MMBFJ304
2SK197E	MMBFJ304
2SK199	2N5485
2SK19BL	J309
2SK19GR	J304
2SK19Y	2N5485
2SK208	MMBFJ202
2SK209	MMBFJ304
2SK210BL	MMBFJ309
2SK210GR	MMBFJ304
2SK210Y	MMBFJ304
2SK211	MMBFJ304

Industry Part Number	Recommended National Device
2SK212C	2N5484
2SK212D	2N5484
2SK212E	2N5484
2SK212F	2N5484
2SK217C	MMBFJ202
2SK217D	MMBFJ304
2SK217E	MMBFJ304
2SK238K14	MMBFJ202
2SK238K15	MMBFJ202
2SK238K16	MMBFJ304
2SK238K17	MMBFJ304
2SK23A-8	2N5485
2SK23A-9	2N4416A
2SK242C	MMBFJ202
2SK242D	MMBFJ202
2SK242E	MMBFJ304
2SK242F	MMBFJ304
2SK25	2N5486
2SK266	PN4117A
2SK270	U403
2SK292	2N5484
2SK30	J211
2SK30AGR	2N4340
2SK30AO	2N4339
2SK30ATM	J211
2SK30AY	2N4340
2SK314	2N4416A
2SK315E	2N5484
2SK315F	2N5485
2SK315G	J211
2SK33	J304
2SK330GR	J202
2SK330Y	J202
2SK331	MMBFJ201
2SK334	MMBFJ201
2SK35	J210
2SK37	2N5484
2SK370	J109

Industry Part Number	Recommended National Device
2SK374	2N4340
2SK376	PN4117A
2SK377	MMBFJ201
2SK381	J113
2SK39	PN4117A
2SK39A	PN4117A
2SK40	2N4339
2SK404	2N5485
2SK40B	2N4339
2SK40C	2N4340
2SK41	2N5486
2SK41C	2N5484
2SK41D	2N5484
2SK41E	2N5484
2SK41F	2N5485
2SK42	2N5484
2SK425	MMBFJ304
2SK426	MMBFJ304
2SK43S	J113
2SK43S-D	J113
2SK47	2N5484
2SK49	2N5484
2SK49E	2N5484
2SK49F	2N5484
2SK49H	2N5484
2SK507	J309
2SK508	MMBFJ309
2SK54	2N5484
2SK54B	2N5484
2SK54C	2N5484
2SK55	2N5485
2SK55D	2N5485
2SK55E	2N5485
2SK56	2N5484
2SK57	2N5484
2SK61	2N5484
2SK65	J201
2SK66	J202

# Cross-Reference of Devices (continued)

Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device
2SK67	MMBFJ201	A5T5086	2N5087	BA136	1N4151
2SK67A	MMBFJ201	A5T5087	2N5087	BA152	1N4150
2SK68	2N4340	A5T5172	2N4124	BA154	1N4150
2SK68A	2N4340	A5T5220	MPS6531	BA165	1N4150
2SK83	2N5484	A5T5223	MPS6521	BA166	1N4454
2SK93	PN4117A	A5T5225	2N4401	BA167	1N4454
2SK94	MMBFJ202	A5T5226	2N4402	BA192	FDH400
A5T2192	PN2222A	A5T5227	PN4249	BA193	FDH400
A5T2222	PN2222A	A5T5400	2N5400	BA194	FDH400
A5T2243	MPSA06	A5T5550	2N5550	BA197	FDH400
A5T2604	2N5087	A5T5551	2N5551	BA198	FDH400
A5T2605	2N5087	A7T3392	MPS3393	BA200	1N4148
A5T2907	PN2907	A7T3392	MPS3393	BA217	1N4148
A5T3392	MPS3393	A7T5172	MPS3393	BA218	1N4148
A5T3504	PN2907	A8T3702	MPS3702	BAS13	FDH400
A5T3506	PN2907	A8T3703	MPS3703	BAS16	BAS16
A5T3638	MPS6534	A8T3704	MPS3704	BAS19	BAS19
A5T3638A	MPS6534	A8T3705	MPS3704	BAS20	BAS21
A5T3644	PN2907	A8T4058	2N5087	BAS21	BAS21
A5T3646	PN2907	A8T4059	2N3905	BAS29	BAS29
A5T3903	2N3903	A8T4060	2N3905	BAS31	BAS31
A5T3904	2N3904	A8T4061	2N3906	BAS35	BAS35
A5T3905	2N3905	A8T5172	MPS3393	BAV19	BAV19
A5T3906	2N3906	AA113	1N4151	BAV20	BAV20
A5T4058	2N5087	AA114	1N916	BAV21	BAV21
A5T4059	2N3905	AA116	1N916	BAV68	BAY72
A5T4060	2N3905	AA129	1N916	BAV69	FDH400
A5T4061	2N3906	AA131	1N916	BAV70	BAV70
A5T4123	2N4123	AA137	1N916	BAV74	BAV74
A5T4124	2N4124	AA138	1N916	BAV99	BAV99
A5T4125	2N4125	AA139	BAV21	BAW10	1N4150
A5T4126	2N4126	AAY10	1N916	BAW11	BAV19
A5T4248	PN4249	AAY48	1N916	BAW12	BAV20
A5T4249	PN4249	AAZ13	1N916	BAW24	1N4150
A5T4402	2N4402	AAZ18	1N916	BAW33	BAY72
A5T4403	2N4403	BA127	1N4151	BAW46	BAY72
A5T5058	MPSA42	BA128	1N4151	BAW47	BAY72
A5T5059	MPSA42	BA130	1N4454	BAW50	FDH400



# Cross-Reference of Devices (continued)

Industry Part Number	Recommended National Device
BAW51	BAY72
BAW52	FDH400
BAW53	1N4150
BAW54	1N4150
BAW55	BAY72
BAW56	BAW56
BAW62	BAW62
BAW75	1N4150
BAW76	BAW76
BAW77	BAY72
BAX13	1N4449
BAX15	FDH400
BAX16	BAX16
BAX17	FDH400
BAX20	FDH444
BAX21	FDH444
BAX83	BAY72
BAY17	BAY72
BAY18	BAY72
BAY19	BAY72
BAY20	FDH400
BAY43	1N4148
BAY60	1N4150
BAY61	1N4150
BAY63	1N4150
BAY68	1N4150
BAY69	1N4150
BAY71	BAY71
BAY72	BAY72
BAY73	BAY73
BAY74	1N4150
BAY80	BAY80
BAY82	BAY82
BC182	BC182
BC183L	BC183L
BC184	BC184
BC184L	BC184L
BC212	BC212

Industry Part Number	Recommended National Device
BC212B	BC212B
BC212L	BC212L
BC214LC	BC214LC
BC237	BC237
BC238	BC238
BC239	BC239
BC307	BC307
BC308	BC308
BC309	BC309
BC327	BC327
BC328	BC328
BC337	BC337
BC338	BC338
BC368	BC368
BC546	BC546
BC547	BC547
BC548	BC548
BC549	BC549
BC550	BC550
BC557	BC557
BC558	BC558
BC559	BC559
BC635	BC635
BC636	BC636
BC637	BC637
BC638	BC638
BC639	BC639
BC640	BC640
BC807	BC807
BC808	BC807
BC817	BC817
BC818	BC817
BC846	BC846
BC847	BC847
BC848	BC848
BC849	BC849
BC850	BC850
BC856	BC856

Industry Part Number	Recommended National Device
BC857	BC857
BC858	BC857
BC859	BC857
BC860	BC857
BCF29	BC857
BCF30	BC857
BCF32	BC847
BCF33	BC847
BCF70	BC857
BCF81	BC847
BCV71	BC846
BCV72	BC846
BCW29	BC857
BCW30	BC857
BCW31	BC847
BCW32	BC847
BCW33	BCW33
BCW60A	BC847
BCW61A	BC857
BCW69	BC857
BCW70	BC857
BCW71	BC847
BCW72	BC847
BCW81	BC847
BCW89	BC856
BCX17	BCX17
BCX18	BCX18
BCX19	BCX19
BCX20	BC817
BCX59-9	BCX59-9
BCX70	BC847
BCX71	BCX71
BCX79	BCX79
BD370	BD370
BD371	BD371
BF244	BF244
BF245	BF245
BF247	BF247

# Cross-Reference of Devices (continued)

Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device
BF256	BF256	BUK453-60B	NDP406A	BZX55B13	BZX55B13
BS170	BS170	BUK455-100A	NDP610B	BZX55B15	BZX55B15
BS270	BS270	BUK455-100B	NDP610B	BZX55B16	BZX55B16
BSR111	MMBFJ111	BUK455-50A	NDP605B	BZX55B18	BZX55B18
BSR112	MMBFJ112	BUK455-50A	NDP505A	BZX55B20	BZX55B20
BSR113	MMBFJ113	BUK456-100A	NDP610A	BZX55B22	BZX55B22
BSR13	MMBT2222	BUK456-100B	NDP610A	BZX55B24	BZX55B24
BSR14	MMBT2222A	BUK456-50A	NDP605B	BZX55B27	BZX55B27
BSR15	MMBT2907	BUK456-50B	NDP605B	BZX55B30	BZX55B30
BSR16	MMBT2907A	BUK456-60A	NDP606B	BZX55B33	BZX55B33
BSR17	BSR17A	BUK456-60B	NDP606B	BZX55B3V3	BZX55B3V3
BSR17	BSR17A	BUK552-100A	NDP410AL	BZX55B3V6	BZX55B3V6
BSR174	MMBFJ174	BUK552-100B	NDP410BL	BZX55B3V9	BZX55B3V9
BSR175	MMBFJ175	BUK552-50A	NDP405BL	BZX55B4V3	BZX55B4V3
BSR176	MMBFJ176	BUK552-50B	NDP405BL	BZX55B4V7	BZX55B4V7
BSR177	MMBFJ177	BUK552-60A	NDP406BL	BZX55B5V1	BZX55B5V1
BSR17A	BSR17A	BUK552-60B	NDP406BL	BZX55B5V6	BZX55B5V6
BSR18	MMBT3906	BUK553-100A	NDP510BL	BZX55B6V2	BZX55B6V2
BSR18A	MMBT3906	BUK553-100B	NDP510A	BZX55B6V8	BZX55B6V8
BSR19	MMBT5550	BUK553-50A	NDP505BL	BZX55B7V5	BZX55B7V5
BSR19A	MMBT5551	BUK553-50B	NDP405AL	BZX55B8V2	BZX55B8V2
BSR20	MMBT5400	BUK553-60A	NDP506BL	BZX55B9V1	BZX55B9V1
BSR20A	MMBT5401	BUK553-60B	NDP406AL	BZX55C10	BZX55C10
BSR56	MMBF4391	BUK555-100A	NDP610B	BZX55C11	BZX55C11
BSR57	MMBF4392	BUK555-100B	NDP410AL	BZX55C12	BZX55C12
BSR58	BSR58	BUK555-50A	NDP605BL	BZX55C13	BZX55C13
BSV52	BSV52	BUK555-50B	NDP505AL	BZX55C15	BZX55C15
BUK452-100A	NDP410A	BUK555-60A	NDP606BL	BZX55C16	BZX55C16
BUK452-100B	NDP410B	BUK555-60B	NDP506AL	BZX55C18	BZX55C18
BUK452-50A	NDP405A	BUZ11	NDP505A	BZX55C20	BZX55C20
BUK452-50B	NDP405B	BUZ11A	NDP505B	BZX55C22	BZX55C22
BUK452-60A	NDP406A	BUZ20	NDP410A	BZX55C24	BZX55C24
BUK452-60B	NDP406B	BUZ21	NDP510A	BZX55C27	BZX55C27
BUK453-100A	NDP510B	BUZ71	NDP405B	BZX55C30	BZX55C30
BUK453-100B	NDP510B	BUZ71A	NDP405B	BZX55C33	BZX55C33
BUK453-50A	NDP505B	BZX55B10	BZX55B10	BZX55C3V3	BZX55C3V3
BUK453-50B	NDP405A	BZX55B11	BZX55B11	BZX55C3V6	BZX55C3V6
BUK453-60A	NDP506B	BZX55B12	BZX55B12	BZX55C3V9	BZX55C3V9

# Cross-Reference of Devices (continued)

Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device
BZX55C4V3	BZX55C4V3	BZX84C15	BZX84C15	BZX85C3V6	BZX85C3V6
BZX55C4V7	BZX55C4V7	BZX84C16	BZX84C16	BZX85C3V9	BZX85C3V9
BZX55C5V1	BZX55C5V1	BZX84C18	BZX84C18	BZX85C4V3	BZX85C4V3
BZX55C5V6	BZX55C5V6	BZX84C20	BZX84C20	BZX85C4V7	BZX85C4V7
BZX55C6V2	BZX55C6V2	BZX84C22	BZX84C22	BZX85C5V1	BZX85C5V1
BZX55C6V8	BZX55C6V8	BZX84C24	BZX84C24	BZX85C5V6	BZX85C5V6
BZX55C7V5	BZX55C7V5	BZX84C27	BZX84C27	BZX85C6V2	BZX85C6V2
BZX55C8V2	BZX55C8V2	BZX84C30	BZX84C30	BZX85C6V8	BZX85C6V8
BZX55C9V1	BZX55C9V1	BZX84C33	BZX84C33	BZX85C7V5	BZX85C7V5
BZX79C10	BZX79C10	BZX84C3V3	BZX84C3V3	BZX85C8V2	BZX85C8V2
BZX79C11	BZX79C11	BZX84C3V6	BZX84C3V6	BZX85C9V1	BZX85C9V1
BZX79C12	BZX79C12	BZX84C3V9	BZX84C3V9	D29E1	MPS6534
BZX79C13	BZX79C13	BZX84C4V3	BZX84C4V3	D29E10	PN2907
BZX79C15	BZX79C15	BZX84C4V7	BZX84C4V7	D29E2	MPS6534
BZX79C16	BZX79C16	BZX84C51	BZX84C51	D29E4	2N4402
BZX79C18	BZX79C18	BZX84C56	BZX84C56	D29E5	2N4402
BZX79C20	BZX79C20	BZX84C5V1	BZX84C5V1	D29E6	2N4403
BZX79C22	BZX79C22	BZX84C5V6	BZX84C5V6	D29E7	2N4403
BZX79C24	BZX79C24	BZX84C62	BZX84C62	D29E9	PN2907
BZX79C27	BZX79C27	BZX84C6V2	BZX84C6V2	D29F1	MPS6534
BZX79C30	BZX79C30	BZX84C6V8	BZX84C6V8	D29F2	MPS6534
BZX79C33	BZX79C33	BZX84C7V5	BZX84C7V5	D29F4	2N5087
BZX79C3V3	BZX79C3V3	BZX84C8V2	BZX84C8V2	D29F5	PN2907
BZX79C3V6	BZX79C3V6	BZX84C9V1	BZX84C9V1	D29F6	PN2907
BZX79C3V9	BZX79C3V9	BZX85C10	BZX85C10	D32H1	MPSA05
BZX79C4V3	BZX79C4V3	BZX85C11	BZX85C11	D32H4	MPSA06
BZX79C4V7	BZX79C4V7	BZX85C12	BZX85C12	D32J1	MPSA55
BZX79C5V1	BZX79C5V1	BZX85C13	BZX85C13	D32J3	MPSA56
BZX79C5V6	BZX79C5V6	BZX85C15	BZX85C15	D32L1	MPSA13
BZX79C6V2	BZX79C6V2	BZX85C16	BZX85C16	D32L2	MPSA14
BZX79C6V8	BZX79C6V8	BZX85C18	BZX85C18	D32L4	MPSA13
BZX79C7V5	BZX79C7V5	BZX85C20	BZX85C20	D32L5	MPSA14
BZX79C8V2	BZX79C8V2	BZX85C22	BZX85C22	D32S1	2N5089
BZX79C9V1	BZX79C9V1	BZX85C24	BZX85C24	D32V1	MPSA42
BZX84C10	BZX84C10	BZX85C27	BZX85C27	D32V2	MPSA42
BZX84C11	BZX84C11	BZX85C30	BZX85C30	D32V3	MPSA42
BZX84C12	BZX84C12	BZX85C33	BZX85C33	D33D21	MPSA05
BZX84C13	BZX84C13	BZX85C3V3	BZX85C3V3	D33D22	MPSA05

# Cross-Reference of Devices (continued)

Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device
D33D23	MPSA05	FAS02618	FAS02618	FDS01502	MMBD1502A
D33D24	MPSA05	FAS02619	FAS02619	FDS01503	MMBD1503A
D33D26	MPSA05	FAS02620	FAS02620	FDS01504	MMBD1504A
D33D26	MPSA05	FAS02719	FAS02719	FDS01505	MMBD1505A
D33D27	2N4401	FAS02720	FAS02720	FDS01701	MMBD1701
D33D28	MPSA06	FD666	FDH600	FDS01702	MMBD1702
D33D29	MPSA06	FD700	FD700	FDS01703	MMBD1703
D33E30	MPSA06	FD777	FD777	FDS01704	MMBD1704
D44C1	D44C11	FDH300	FDH300A	FDS01705	MMBD1705
D44C10	D44C11	FDH300A	FDH300A	FDS04148	MMBD4148
D44C11	D44C11	FDH333	FDH333	FDS04148	MMBD4148
D44C12	D44C11	FDH400	FDH400	FDS0914	MMBD914
D44C2	D44C11	FDH444	FDH444	FJT1100	FJT1100
D44C3	D44C11	FDH600	FDH600	FJT1101	FJT1101
D44C4	D44C11	FDH666	FDH600	FMMD2835	MMBD1205
D44C5	D44C11	FDH900	FDH600	FMMD2836	MMBD1205
D44C6	D44C11	FDH999	1N4148	FMMD2837	MMBD1204
D44C7	D44C11	FDLL300	FDLL300	FMMD2838	MMBD1204
D44C8	D44C11	FDLL3595	FDLL3595	FMMD6100	MMBD4148
D44C9	D44C11	FDLL4148	FDLL4148	FMMD914	MMBD914
DA1701	1N4148	FDLL4150	FDLL4150	FMMT2222	MMBT2222
DA1702	1N4148	FDLL4448	FDLL4448	FMMT2222A	MMBT2222A
DA1703	1N4148	FDLL600	FDLL600	FMMT2369	MMBT2369
DA1704	1N4148	FDLL914	FDLL914	FMMT2369A	MMBT2369A
EN1132	MPS6534	FDN400	FDH400	FMMT2907	MMBT2907
EN2369A	PN2369A	FDN444	FDH444	FMMT2907A	MMBT2907A
EN3009	PN3646	FDN666	FDH600	FMMT3903	MMBT3904
EN3013	PN3646	FDS01201	MMBD1201	FMMT3904	MMBT3904
EN3014	PN3646	FDS01202	MMBD1202	FMMT3905	MMBT3906
EN3502	PN3646	FDS01203	MMBD1203	FMMT3906	MMBT3906
EN914	PN3646	FDS01204	MMBD1204	FMMT4123	MMBT3904
EN915	2N3903	FDS01205	MMBD1205	FMMT4124	MMBT4124
EN916	2N3903	FDS01401	MMBD1401	FMMT4125	MMBT3906
FAS02503	FAS02503	FDS01402	MMBD1402	FMMT4126	MMBT4126
FAS02509	FAS02509	FDS01403	MMBD1403	FMMT4400	MMBT4400
FAS02563	FAS02563	FDS01404	MMBD1404	FMMT4401	MMBT4401
FAS02564	FAS02564	FDS01405	MMBD1405	FMMT4402	MMBT4403
FAS02565	FAS02565	FDS01501	MMBD1501A	FMMT4403	MMBT4403



# Cross-Reference of Devices (continued)

Industry Part Number	Recommended National Device
FMMT5086	MMBT5086
FMMT5087	MMBT5087
FMMT5088	MMBT5088
FMMT5089	MMBT5089
FMMTA05	MMBTA05
FMMTA06	MMBTA06
FMMTA13	MMBTA13
FMMTA14	MMBTA14
FMMTA20	MMBT3904
FMMTA42	MMBTA42
FMMTA43	MMBTA42
FMMTA55	MMBTA55
FMMTA56	MMBTA56
FMMTA70	MMBT5086
FMMTA92	MMBTA92
FMMTA93	MMBTA92
FMMZ5232	MMBZ5232B
FMMZ5233	MMBZ5233B
FMMZ5234	MMBZ5234B
FMMZ5235	MMBZ5235B
FMMZ5236	MMBZ5236B
FMMZ5237	MMBZ5237B
FMMZ5238	MMBZ5238B
FMMZ5239	MMBZ5239B
FMMZ5240	MMBZ5240B
FMMZ5241	MMBZ5241B
FMMZ5242	MMBZ5242B
FMMZ5243	MMBZ5243B
FMMZ5244	MMBZ5244B
FMMZ5245	MMBZ5245B
FMMZ5246	MMBZ5246B
FMMZ5247	MMBZ5247B
FMMZ5248	MMBZ5248B
FMMZ5249	MMBZ5249B
FMMZ5251	MMBZ5251B
FMMZ5252	MMBZ5252B
FMMZ5253	MMBZ5253B
FMMZ5254	MMBZ5254B

Industry Part Number	Recommended National Device
FMMZ5255	MMBZ5255B
FMMZ5256	MMBZ5256B
FMMZ5257	MMBZ5257B
FT3903	2N3903
FT3904	2N3904
FT3905	2N3905
FT3906	2N3906
GE-10	PN2222
GE-17	MPSA05
GE-20	2N4401
GET2221	PN2222
GET2221A	PN2222A
GET2222	PN2222
GET2222A	PN2222A
GET2369	PN2369
GET2907	PN2907
GET3638	MPS6534
GET3638A	MPS6534
GET3646	PN2907
GET5305	MPSA13
GET5306	MPSA14
GET5307	MPSA13
GET5308	MPSA14
GET5308A	MPSA14
GET929	MPS6514
GET930	MPS6514
IRF510	NDP410B
IRF520	NDP410A
IRF521	NDP508B
IRF522	NDP410B
IRF523	NDP408B
IRF530	NDP510B
IRF531	NDP408A
IRF532	NDP410A
IRF533	NDP408B
IRF540	NDP610B
IRF541	NDP508A
IRF542	NDP610B

Industry Part Number	Recommended National Device
IRF543	NDP508B
IRFP044	NDP606B
IRFP054	NDP706A
IRFR014	NDD406B
IRFR024	NDD406A
IRFU014	NDU406B
IRFU024	NDU406A
IRFZ10	NDP405B
IRFZ12	NDP405B
IRFZ14	NDP406B
IRFZ15	NDP406B
IRFZ20	NDP405A
IRFZ22	NDP405A
IRFZ24	NDP406A
IRFZ25	NDP406A
IRFZ30	NDP505A
IRFZ32	NDP505B
IRFZ34	NDP506A
IRFZ35	NDP505B
IRFZ40	NDP605B
IRFZ42	NDP605B
IRFZ44	NDP606B
IRFZ45	NDP606B
IRL510	NDP410BL
IRL520	NDP410AL
IRL530	NDP510BL
IRL540	NDP610BL
IRLR014	NDD406BL
IRLR024	NDD406AL
IRLU014	NDU406BL
IRLU024	NDU406AL
IRLZ14	NDP406B
IRLZ24	NDP406A
IRLZ34	NDP506A
IRLZ44	NDP606B
J105	J105
J106	J106
J108	J108



# Cross-Reference of Devices (continued)

Industry Part Number	Recommended National Device
J109	J109
J110	J110
J111	J111
J112	J112
J113	J113
J174	J174
J175	J175
J176	J176
J177	J177
J201	J201
J202	J202
J203	J202
J211	J211
J270	J270
J270	J270
J271	J271
J300	J300
J304	J304
J305	J305
J308	J309
J309	J309
J310	J310
MM2055-2	2N2907
MM2270	2N2270
MM3005	2N3019
MM3006	2N3019
MM3019	2N3019
MM3020	2N3019
MM3053	2N3053
MM4005	2N4032
MM4006	2N4033
MM4007	2N4033
MM4009	2N4033
MM4030	2N4032
MM4031	2N4033
MM4032	2N4032
MM4033	2N4033
MM4036	2N4036

Industry Part Number	Recommended National Device
MM4037	2N4037
MM4208	2N4208
MM4209	2N4209
MM4257	2N4208
MM5005	2N4032
MM5006	2N4033
MMBD1201	MMBD1201
MMBD1202	MMBD1202
MMBD1203	MMBD1203
MMBD1204	MMBD1204
MMBD1205	MMBD1205
MMBD1401	MMBD1401
MMBD1402	MMBD1402
MMBD1403	MMBD1403
MMBD1404	MMBD1404
MMBD1405	MMBD1405
MMBD1501	MMBD1501A
MMBD1501A	MMBD1501A
MMBD1502	MMBD1502A
MMBD1502A	MMBD1502A
MMBD1503	MMBD1503A
MMBD1503A	MMBD1503A
MMBD1504	MMBD1504A
MMBD1504A	MMBD1504A
MMBD1505	MMBD1505A
MMBD1505A	MMBD1505A
MMBD1701	MMBD1701
MMBD1702	MMBD1702
MMBD1703	MMBD1703
MMBD1704	MMBD1704
MMBD1705	MMBD1705
MMBD2835	MMBD1205
MMBD2836	MMBD1205
MMBD2837	MMBD1204
MMBD2838	MMBD1204
MMBD4148	MMBD4148
MMBD4148	MMBD4148
MMBD6100	MMBD4148

Industry Part Number	Recommended National Device
MMBD914	MMBD914
MMBF4118	MMBF4118
MMBF4119	MMBF4119
MMBF4391	MMBF4391
MMBF4392	MMBF4392
MMBF4393	MMBF4393
MMBF4416	MMBF4416
MMBF4859	MMBF4859
MMBF4860	MMBFJ112
MMBF4861	MMBF4861
MMBF5114	MMBF5114
MMBF5115	MMBF5115
MMBF5116	MMBF5116
MMBF5457	MMBF5457
MMBF5458	MMBF5458
MMBF5459	MMBF5459
MMBF5460	MMBF5460
MMBF5461	MMBF5461
MMBF5462	MMBF5462
MMBF5484	MMBF5484
MMBF5486	MMBF5486
MMBFJ111	MMBFJ111
MMBFJ112	MMBFJ112
MMBFJ113	MMBFJ113
MMBFJ174	MMBFJ174
MMBFJ175	MMBFJ175
MMBFJ176	MMBFJ176
MMBFJ177	MMBFJ177
MMBFJ201	MMBFJ201
MMBFJ202	MMBFJ202
MMBFJ203	MMBFJ203
MMBFJ270	MMBFJ270
MMBFJ271	MMBFJ271
MMBFJ304	MMBFJ304
MMBFJ305	MMBFJ305
MMBFJ308	MMBFJ309
MMBFJ309	MMBFJ309
MMBFJ310	MMBFJ310

# Cross-Reference of Devices (continued)

Industry Part Number	Recommended National Device
MMBFU310	MMBFJ310
MMBT100	MMBT100
MMBT200	MMBT200
MMBT2222	MMBT2222
MMBT2222A	MMBT2222A
MMBT2369	MMBT2369
MMBT2905	MMBT2907
MMBT2905A	MMBT2907A
MMBT2907	MMBT2907
MMBT2907A	MMBT2907A
MMBT3393	MMBT2222
MMBT3640	MMBT3640
MMBT3642	MMBT100
MMBT3646	MMBT3646
MMBT3904	MMBT3904
MMBT3906	MMBT3906
MMBT4123	MMBT3904
MMBT4124	MMBT4124
MMBT4125	MMBT3906
MMBT4126	MMBT4126
MMBT4209	MMBT4209
MMBT4258	MMBT4258
MMBT4400	MMBT4401
MMBT4401	MMBT4401
MMBT4402	MMBT4403
MMBT4403	MMBT4403
MMBT5086	MMBT5086
MMBT5087	MMBT5087
MMBT5088	MMBT5088
MMBT5089	MMBT5089
MMBT5179	MMBT5179
MMBT5401	MMBT5401
MMBT5550	MMBT5550
MMBT5551	MMBT5551
MMBT5771	MMBT5771
MMBT6515	MMBT6515
MMBTA05	MMBTA05
MMBTA06	MMBTA06

Industry Part Number	Recommended National Device
MMBTA13	MMBTA13
MMBTA14	MMBTA14
MMBTA20	MMBT3904
MMBTA42	MMBTA42
MMBTA43	MMBTA42
MMBTA55	MMBTA55
MMBTA56	MMBTA56
MMBTA70	MMBT5086
MMBTA92	MMBTA92
MMBTA93	MMBTA92
MMBTH10	MMBTH10
MMBTH11	MMBTH11
MMBTH24	MMBTH24
MMBTH34	MMBTH34
MMBTH81	MMBTH81
MMBZ5226	MMBZ5226B
MMBZ5226B	MMBZ5226B
MMBZ5227	MMBZ5227B
MMBZ5227B	MMBZ5227B
MMBZ5228	MMBZ5228B
MMBZ5228B	MMBZ5228B
MMBZ5229	MMBZ5229B
MMBZ5229B	MMBZ5229B
MMBZ5230	MMBZ5230B
MMBZ5230B	MMBZ5230B
MMBZ5231	MMBZ5231B
MMBZ5231B	MMBZ5231B
MMBZ5232B	MMBZ5232B
MMBZ5233	MMBZ5233B
MMBZ5233B	MMBZ5233B
MMBZ5234	MMBZ5234B
MMBZ5234B	MMBZ5234B
MMBZ5235	MMBZ5235B
MMBZ5235B	MMBZ5235B
MMBZ5236	MMBZ5236B
MMBZ5236B	MMBZ5236B
MMBZ5237	MMBZ5237B
MMBZ5237B	MMBZ5237B

Industry Part Number	Recommended National Device
MMBZ5238	MMBZ5238B
MMBZ5238B	MMBZ5238B
MMBZ5239	MMBZ5239B
MMBZ5239B	MMBZ5239B
MMBZ5240	MMBZ5240B
MMBZ5240B	MMBZ5240B
MMBZ5241	MMBZ5241B
MMBZ5241B	MMBZ5241B
MMBZ5242	MMBZ5242B
MMBZ5242B	MMBZ5242B
MMBZ5243	MMBZ5243B
MMBZ5243B	MMBZ5243B
MMBZ5244	MMBZ5244B
MMBZ5244B	MMBZ5244B
MMBZ5245	MMBZ5245B
MMBZ5245B	MMBZ5245B
MMBZ5246	MMBZ5246B
MMBZ5246B	MMBZ5246B
MMBZ5247	MMBZ5247B
MMBZ5247B	MMBZ5247B
MMBZ5248	MMBZ5248B
MMBZ5248B	MMBZ5248B
MMBZ5249	MMBZ5249B
MMBZ5249B	MMBZ5249B
MMBZ5250B	MMBZ5250B
MMBZ5251B	MMBZ5251B
MMBZ5252B	MMBZ5252B
MMBZ5253B	MMBZ5253B
MMBZ5254B	MMBZ5254B
MMBZ5255B	MMBZ5255B
MMBZ5256B	MMBZ5256B
MMBZ5257B	MMBZ5257B
MMST2222	MMBT2222
MMST2222A	MMBT2222A
MMST2907	MMBT2907
MMST2907A	MMBT2907A
MMST3904	MMBT3904
MMST3906	MMBT3906

# Cross-Reference of Devices (continued)

Industry Part Number	Recommended National Device
MMST4124	MMBT3904
MMST4126	MMBT3906
MMST4401	MMBT4401
MMST4403	MMBT4403
MMST5086	MMBT5086
MMST5087	MMBT5087
MMST5088	MMBT5088
MMST5089	MMBT5089
MMSTA06	MMBTA06
MMSTA13	MMBTA13
MMSTA14	MMBTA14
MMSTA20	MMBT3904
MMSTA56	MMBTA56
MMSTA70	MMBTA5086
MPE910	2N7000
MPF102	BF245A
MPF108	BF245
MPF111	BF245
MPF256	J309
MPF3822	2N3822
MPF3823	2N3822
MPF4391	PN4391
MPF4392	PN4392
MPF4416	PN4416
MPF4856A	2N4856
MPF4857A	2N4856
MPF4858A	2N4858
MPF4859A	2N4859
MPF4860A	2N4860
MPF4861A	2N4861
MPF970	J174
MPF971	J176
MPS2222	PN2222
MPS2222A	PN2222A
MPS2369	PN2369
MPS2369A	PN2369A
MPS2713	2N3904
MPS2714	PN2369

Industry Part Number	Recommended National Device
MPS2907	PN2907
MPS2907A	PN2907A
MPS2923	2N4123
MPS2923	2N4123
MPS2924	2N4124
MPS2925	2N4124
MPS2926	2N4124
MPS3392	PN2222
MPS3393	PN2222
MPS3394	PN2222
MPS3395	PN2222
MPS3564	PN2369
MPS3638	PN3638
MPS3639	PN3640
MPS3640	PN3640
MPS3644	PN3644
MPS3645	PN3645
MPS3646	PN3646
MPS3702	MPS3702
MPS3703	MPS3703
MPS3704	MPS3704
MPS3705	MPS3705
MPS3706	PN930
MPS3707	PN930
MPS3709	PN930
MPS3710	PN930
MPS3711	PN930
MPS3904	2N3904
MPS3905	2N3905
MPS3906	2N3906
MPS4888	2N5401
MPS4889	2N5401
MPS5134	PN2369
MPS5172	PN2222
MPS5551	2N5551
MPS6512	MPS6513
MPS6513	MPS6513
MPS6514	MPS6514

Industry Part Number	Recommended National Device
MPS6515	MPS6515
MPS6516	PN4121
MPS6518	MPS6518
MPS6520	MPS6521
MPS6521	MPS6521
MPS6522	2N3904
MPS6523	2N5087
MPS6530	2N3904
MPS6531	2N3904
MPS6532	2N3904
MPS6533	2N3906
MPS6534	2N3906
MPS6535	2N3906
MPS6535	2N3906
MPS6571	2N5088
MPS6573	PN100
MPS6574	PN100
MPS6575	PN100
MPS6576	PN100
MPS706	PN2369
MPS706A	PN2369
MPS708	PN2369
MPS8098	MPS8098
MPS834	PN2369
MPS836	PN2369
MPS929A	PN2369
MPS930	PN2369
MPSA05	MPSA05
MPSA06	MPSA06
MPSA09	2N5088
MPSA10	PN2222A
MPSA12	MPSA12
MPSA13	MPSA13
MPSA14	MPSA14
MPSA18	MPSA18
MPSA25	2N7053
MPSA26	2N7053
MPSA27	2N7053



# Cross-Reference of Devices (continued)

Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device
MPSA42	MPSA42	MTP10N10E	NDP410BE	NDB405BEL	NDB405BEL
MPSA43	MPSA43	MTP12N05E	NDP505A	NDB405BL	NDB405BL
MPSA55	MPSA55	MTP12N06	NDP406B	NDB406A	NDB406A
MPSA56	MPSA56	MTP12N08	NDP408A	NDB406AE	NDB406AE
MPSA62	MPSA63	MTP12N08L	NDP408BL	NDB406AEL	NDB406AEL
MPSA63	MPSA63	MTP12N10	NDP510B	NDB406AL	NDB406AL
MPSA64	MPSA65	MTP15N05	NDP405B	NDB406B	NDB406B
MPSA70	2N5087	MTP15N05E	NDP405A	NDB406BE	NDB406BE
MPSA92	MPSA92	MTP15N05L	NDP405B	NDB406BEL	NDB406BEL
MPSA93	MPSA92	MTP15N06	NDP406B	NDB406BL	NDB406BL
MPSD01	MPSA42	MTP15N06E	NDP406BE	NDB408A	NDB408A
MPSD02	2N5550	MTP15N06L	NDP406B	NDB408AE	NDB408AE
MPSD03	2N5550	MTP15N08L	NDP508BL	NDB408AEL	NDB408AEL
MPSD04	MPSA12	MTP20N08	NDP508B	NDB408AL	NDB408AL
MPSD05	MPSA06	MTP20N10	NDP510B	NDB408B	NDB408B
MPSD06	2N4400	MTP20N10E	NDP510BE	NDB408BE	NDB408BE
MPSD51	MPSA92	MTP25N05	NDP505B	NDB408BEL	NDB408BEL
MPSD52	2N5401	MTP25N06	NDP506B	NDB408BL	NDB408BL
MPSD53	2N5550	MTP25N06E	NDP506BE	NDB410A	NDB410A
MPSD56	2N3906	MTP25N06L	NDP506BL	NDB410AE	NDB410AE
MPSH10	MPSH10	MTP25N10	NDP610B	NDB410AEL	NDB410AEL
MPSL01	2N5550	MTP25N10E	NDP610BE	NDB410AL	NDB410AL
MPSL51	2N5550	MTP3055E	NDP406BE	NDB410B	NDB410B
MTD10N05E	NDD406A	MTP3055EL	NDP406BE	NDB410BE	NDB410BE
MTD10N05E-1	NDU406A	MTP30N05E	NDP505AE	NDB410BEL	NDB410BEL
MTD3055E	MTD3055E	MTP35N06E	NDP505AE	NDB410BL	NDB410BL
MTD3055E-1	MTD3055E1	MTP40N06EL	NDP606BEL	NDB505A	NDB505A
MTD3055EL	MTD3055EL	MTP45N05E	NDP605BE	NDB505AE	NDB505AE
MTD3055EL-1	MTD3055EL1	MTP50N05E	NDP605BE	NDB505AEL	NDB505AEL
MTD5N05	NDD406B	MTP50N05EL	NDP605BEL	NDB505AL	NDB505AL
MTD5N05-1	NDU406B	MTP8N10	NDP410B	NDB505B	NDB505B
MTD5N06	NDD406B	MTP8N10E	NDP410BE	NDB505BE	NDB505BE
MTD5N06-1	NDU406B	NDB405A	NDB405A	NDB505BEL	NDB505BEL
MTP10N05	NDP405B	NDB405AE	NDB405AE	NDB505BL	NDB505BL
MTP10N06	NDP406B	NDB405AEL	NDB405AEL	NDB506A	NDB506A
MTP10N06E	NDP406BE	NDB405AL	NDB405AL	NDB506AE	NDB506AE
MTP10N08	NDP408B	NDB405B	NDB405B	NDB506AEL	NDB506AEL
MTP10N10	NDP410B	NDB405BE	NDB405BE	NDB506AL	NDB506AL

# Cross-Reference of Devices (continued)

Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device
NDB506B	NDB506B	NDB608AEL	NDB608AEL	NDB710A	NDB710A
NDB506BE	NDB506BE	NDB608AL	NDB608AL	NDB710AE	NDB710AE
NDB506BEL	NDB506BEL	NDB608B	NDB608B	NDB710AEL	NDB710AEL
NDB506BL	NDB506BL	NDB608BE	NDB608BE	NDB710AL	NDB710AL
NDB508A	NDB508A	NDB608BEL	NDB608BEL	NDB710B	NDB710B
NDB508AE	NDB508AE	NDB608BL	NDB608BL	NDB710BE	NDB710BE
NDB508AEL	NDB508AEL	NDB610A	NDB610A	NDB710BEL	NDB710BEL
NDB508AL	NDB508AL	NDB610AE	NDB610AE	NDB710BL	NDB710BL
NDB508B	NDB508B	NDB610AEL	NDB610AEL	NDD406A	NDD406A
NDB508BE	NDB508BE	NDB610AL	NDB610AL	NDD406AL	NDD406AL
NDB508BEL	NDB508BEL	NDB610B	NDB610B	NDD406B	NDD406B
NDB508BL	NDB508BL	NDB610BE	NDB610BE	NDD406BL	NDD406BL
NDB510A	NDB510A	NDB610BEL	NDB610BEL	NDD506A	NDD506A
NDB510AE	NDB510AE	NDB610BL	NDB610BL	NDD506AL	NDD506AL
NDB510AEL	NDB510AEL	NDB705A	NDB705A	NDD506B	NDD506B
NDB510AL	NDB510AL	NDB705AE	NDB705AE	NDD506BL	NDD506BL
NDB510B	NDB510B	NDB705AEL	NDB705AEL	NDP405A	NDP405A
NDB510BE	NDB510BE	NDB705AL	NDB705AL	NDP405AE	NDP405AE
NDB510BEL	NDB510BEL	NDB705B	NDB705B	NDP405AEL	NDP405AEL
NDB510BL	NDB510BL	NDB705BE	NDB705BE	NDP405AL	NDP405AL
NDB605A	NDB605A	NDB705BEL	NDB705BEL	NDP405B	NDP405B
NDB605AE	NDB605AE	NDB705BL	NDB705BL	NDP405BE	NDP405BE
NDB605AEL	NDB605AEL	NDB706A	NDB706A	NDP405BEL	NDP405BEL
NDB605AL	NDB605AL	NDB706AE	NDB706AE	NDP405BL	NDP405BL
NDB605B	NDB605B	NDB706AEL	NDB706AEL	NDP406A	NDP406A
NDB605BE	NDB605BE	NDB706AL	NDB706AL	NDP406AE	NDP406AE
NDB605BEL	NDB605BEL	NDB706B	NDB706B	NDP406AEL	NDP406AEL
NDB605BL	NDB605BL	NDB706BE	NDB706BE	NDP406AL	NDP406AL
NDB606A	NDB606A	NDB706BEL	NDB706BEL	NDP406B	NDP406B
NDB606AE	NDB606AE	NDB706BL	NDB706BL	NDP406BE	NDP406BE
NDB606AEL	NDB606AEL	NDB708A	NDB708A	NDP406BEL	NDP406BEL
NDB606AL	NDB606AL	NDB708AE	NDB708AE	NDP406BL	NDP406BL
NDB606B	NDB606B	NDB708AEL	NDB708AEL	NDP408A	NDP408A
NDB606BE	NDB606BE	NDB708AL	NDB708AL	NDP408AE	NDP408AE
NDB606BEL	NDB606BEL	NDB708B	NDB708B	NDP408AEL	NDP408AEL
NDB606BL	NDB606BL	NDB708BE	NDB708BE	NDP408AL	NDP408AL
NDB608A	NDB608A	NDB708BEL	NDB708BEL	NDP408B	NDP408B
NDB608AE	NDB608AE	NDB708BL	NDB708BL	NDP408BE	NDP408BE



# Cross-Reference of Devices (continued)

Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device
NDP408BEL	NDP408BEL	NDP510B	NDP510B	NDP705AEL	NDP705AEL
NDP408BL	NDP408BL	NDP510BE	NDP510BE	NDP705AL	NDP705AL
NDP410A	NDP410A	NDP510BEL	NDP510BEL	NDP705B	NDP705B
NDP410AE	NDP410AE	NDP510BL	NDP510BL	NDP705BE	NDP705BE
NDP410AEL	NDP410AEL	NDP605A	NDP605A	NDP705BEL	NDP705BEL
NDP410AL	NDP410AL	NDP605AE	NDP605AE	NDP705BL	NDP705BL
NDP410B	NDP410B	NDP605AEL	NDP605AEL	NDP706A	NDP706A
NDP410BE	NDP410BE	NDP605AL	NDP605AL	NDP706AE	NDP706AE
NDP410BEL	NDP410BEL	NDP605B	NDP605B	NDP706AEL	NDP706AEL
NDP410BL	NDP410BL	NDP605BE	NDP605BE	NDP706AL	NDP706AL
NDP505A	NDP505A	NDP605BEL	NDP605BEL	NDP706B	NDP706B
NDP505AE	NDP505AE	NDP605BL	NDP605BL	NDP706BE	NDP706BE
NDP505AEL	NDP505AEL	NDP606A	NDP606A	NDP706BEL	NDP706BEL
NDP505AL	NDP505AL	NDP606AE	NDP606AE	NDP706BL	NDP706BL
NDP505B	NDP505B	NDP606AEL	NDP606AEL	NDP708A	NDP708A
NDP505BE	NDP505BE	NDP606AL	NDP606AL	NDP708AE	NDP708AE
NDP505BEL	NDP505BEL	NDP606B	NDP606B	NDP708AEL	NDP708AEL
NDP505BL	NDP505BL	NDP606BE	NDP606BE	NDP708AL	NDP708AL
NDP506A	NDP506A	NDP606BEL	NDP606BEL	NDP708B	NDP708B
NDP506AE	NDP506AE	NDP606BL	NDP606BL	NDP708BE	NDP708BE
NDP506AEL	NDP506AEL	NDP608A	NDP608A	NDP708BEL	NDP708BEL
NDP506AL	NDP506AL	NDP608AE	NDP608AE	NDP708BL	NDP708BL
NDP506B	NDP506B	NDP608AEL	NDP608AEL	NDP710A	NDP710A
NDP506BE	NDP506BE	NDP608AL	NDP608AL	NDP710AE	NDP710AE
NDP506BEL	NDP506BEL	NDP608B	NDP608B	NDP710AEL	NDP710AEL
NDP506BL	NDP506BL	NDP608BE	NDP608BE	NDP710AL	NDP710AL
NDP508A	NDP508A	NDP608BEL	NDP608BEL	NDP710B	NDP710B
NDP508AE	NDP508AE	NDP608BL	NDP608BL	NDP710BE	NDP710BE
NDP508AEL	NDP508AEL	NDP610A	NDP610A	NDP710BEL	NDP710BEL
NDP508AL	NDP508AL	NDP610AE	NDP610AE	NDP710BL	NDP710BL
NDP508B	NDP508B	NDP610AEL	NDP610AEL	NDS9400	NDS9400
NDP508BE	NDP508BE	NDP610AL	NDP610AL	NDS9405	NDS9405
NDP508BEL	NDP508BEL	NDP610B	NDP610B	NDS9407	NDS9407
NDP508BL	NDP508BL	NDP610BE	NDP610BE	NDS9410	NDS9410
NDP510A	NDP510A	NDP610BEL	NDP610BEL	NDS9430	NDS9430
NDP510AE	NDP510AE	NDP610BL	NDP610BL	NDS9435	NDS9435
NDP510AEL	NDP510AEL	NDP705A	NDP705A	NDS9942	NDS9942
NDP510AL	NDP510AL	NDP705AE	NDP705AE	NDS9943	NDS9943

# Cross-Reference of Devices (continued)

Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device
NDS9945	NDS9945	PMBT2219A	MMBT2222A	PMBZ5226B	MMBZ5226B
NDS9947	NDS9947	PMBT2222	MMBT2222	PMBZ5227B	MMBZ5227B
NDS9948	NDS9948	PMBT2222A	MMBT2222A	PMBZ5228B	MMBZ5228B
NDS9952	NDS9952	PMBT2369	MMBT2369	PMBZ5229B	MMBZ5229B
NDS9953	NDS9953	PMBT2905	MMBT2907	PMBZ5230B	MMBZ5230B
NDS9955	NDS9955	PMBT2905A	MMBT2907A	PMBZ5231B	MMBZ5231B
NDS9956	NDS9956	PMBT2907	MMBT2907	PMBZ5232B	MMBZ5232B
NDS9958	NDS9958	PMBT2907A	MMBT2907A	PMBZ5233B	MMBZ5233B
NDU406A	NDU406A	PMBT3640	MMBT3640	PMBZ5234B	MMBZ5234B
NDU406AL	NDU406AL	PMBT3903	MMBT3904	PMBZ5235B	MMBZ5235B
NDU406B	NDU406B	PMBT3904	MMBT3904	PMBZ5236B	MMBZ5236B
NDU406BL	NDU406BL	PMBT3905	MMBT3906	PMBZ5237B	MMBZ5237B
NDU506A	NDU506A	PMBT3906	MMBT3906	PMBZ5238B	MMBZ5238B
NDU506AL	NDU506AL	PMBT4400	MMBT4401	PMBZ5239B	MMBZ5239B
NDU506B	NDU506B	PMBT4401	MMBT4401	PMBZ5240B	MMBZ5240B
NDU506BL	NDU506BL	PMBT4402	MMBT4403	PMBZ5241B	MMBZ5241B
PF5102	PF5102	PMBT4403	MMBT4403	PMBZ5242B	MMBZ5242B
PF5103	PF5103	PMBT5086	MMBT5086	PMBZ5243B	MMBZ5243B
PF5301	PF5301	PMBT5087	MMBT5087	PMBZ5244B	MMBZ5244B
PF5301-1	PF5301-1	PMBT5088	MMBT5088	PMBZ5245B	MMBZ5245B
PMBD2835	MMBD1205	PMBT5089	MMBT5089	PMBZ5246B	MMBZ5246B
PMBD2836	MMBD1205	PMBT5401	MMBT5401	PMBZ5247B	MMBZ5247B
PMBD2837	MMBD1204	PMBT5550	MMBT5550	PMBZ5248B	MMBZ5248B
PMBD2838	MMBD1204	PMBT5551	MMBT5551	PMBZ5249B	MMBZ5249B
PMBD6100	MMBD4148	PMBTA05	MMBTA05	PMBZ5250B	MMBZ5250B
PMBD914	MMBD914	PMBTA06	MMBTA06	PMBZ5251B	MMBZ5251B
PMBF4391	MMBF4391	PMBTA13	MMBTA13	PMBZ5252B	MMBZ5252B
PMBF4392	MMBF4392	PMBTA14	MMBTA14	PMBZ5253B	MMBZ5253B
PMBF4393	MMBF4393	PMBTA20	MMBT3904	PMBZ5254B	MMBZ5254B
PMBF4416	MMBF4416	PMBTA42	MMBTA42	PMBZ5255B	MMBZ5255B
PMBFJ174	MMBFJ174	PMBTA43	MMBTA42	PMBZ5256B	MMBZ5256B
PMBFJ175	MMBFJ175	PMBTA55	MMBTA55	PMBZ5257B	MMBZ5257B
PMBFJ176	MMBFJ176	PMBTA56	MMBTA56	PN100	PN100
PMBFJ177	MMBFJ177	PMBTA70	MMBT5086	PN100A	PN100A
PMBFJ308	MMBFJ309	PMBTA92	MMBTA92	PN200	PN200
PMBFJ309	MMBFJ309	PMBTA93	MMBTA92	PN200A	PN200A
PMBFJ310	MMBFJ310	PMBTH10	MMBTH10	PN2222	PN2222
PMBT2219	MMBT2222	PMBTH81	MMBTH81	PN2222A	PN2222A

# Cross-Reference of Devices (continued)

Industry Part Number	Recommended National Device
PN2369	PN2369
PN2907	PN2907
PN2907A	PN2907A
PN3563	PN3563
PN3565	PN3565
PN3566	PN3566
PN3567	PN3567
PN3568	PN3568
PN3569	PN3569
PN3638	PN3638
PN3638A	PN3638A
PN3640	PN3640
PN3642	PN3642
PN3643	PN3643
PN3644	PN3644
PN3646	PN3646
PN4091	PN4091
PN4092	PN4092
PN4093	PN4093
PN4117	PN4117
PN4117A	PN4117A
PN4121	PN4121
PN4122	PN4122
PN4141	PN4141
PN4143	PN4143
PN4248	2N5087
PN4249	2N5087
PN4249	PN4249
PN4250	PN4250
PN4250A	PN4250A
PN4258	PN4258
PN4275	PN4275
PN4303	PN4303
PN4355	PN4355
PN4356	PN4356
PN4391	PN4391
PN4392	PN4392
PN4393	PN4393

Industry Part Number	Recommended National Device
PN4416	PN4416
PN4858	PN4858
PN4888	2N5401
PN4917	PN4917
PN5134	PN5134
PN5135	PN3643
PN5136	PN3643
PN5137	PN3643
PN5138	PN5138
PN5139	PN5138
PN5142	2N3905
PN5143	2N3905
PN5415	MPSA92
PN5416	MPSA92
PN5432	PN5432
PN5434	PN5434
PN5855	MPSA55
PN5857	MPSA56
PN5965	2N5551
PN930	PN930
PXT2222A	MMBT2222A
PXT2907A	MMBT2907A
PXT3904	MMBT3904
PXT3906	MMBT3906
PXT4401	MMBT4401
PXT4403	MMBT4403
PXTA14	MMBTA14
PXTA42	MMBTA42
PXTA92	MMBTA92
RFD12N06RLE	NDU406AL
RFD12N06RLES	NDD406AL
RFD14N05	NDU406A
RFD14N05L	NDU406AL
RFD14N05LSM	NDD406AL
RFD14N05SM	NDD406A
RFD16N05	NDU506A
RFD16N05L	NDU506AL
RFD16N05LSM	NDD506AL

Industry Part Number	Recommended National Device
RFD16N05SM	NDD506A
RFD3055RLE	MTD3055EL1
RFD3055RLESM	MTD3055EL
RFH45N05	NDP605B
RFH45N06	NDP606B
RFP12N08	NDP408B
RFP12N08L	NDP408BL
RFP12N10	NDP510B
RFP12N10L	NDP510BL
RFP14N05	NDP405A
RFP15N05	NDP405A
RFP15N06	NDP406A
RFP18N08	NDP508B
RFP18N10	NDP610B
RFP22N10	NDP610B
RFP25N05	NDP505A
RFP25N06	NDP506B
RFP40N10	NDP710A
RFP50N05	NDP605A
RFP50N05L	NDP605AL
SI9400DY	NDS9400
SI9405DY	NDS9405
SI9407DY	NDS9407
SI9410DY	NDS9410
SI9430DY	NDS9430
SI9435DY	NDS9435
SI9942DY	NDS9942
SI9943DY	NDS9943
SI9945DY	NDS9945
SI9947DY	NDS9947
SI9948DY	NDS9948
SI9952DY	NDS9952
SI9953DY	NDS9953
SI9955DY	NDS9955
SI9956DY	NDS9956
SI9958DY	NDS9958
SMBT2222	MMBT2222
SMBT2222A	MMBT2222A

# Cross-Reference of Devices (continued)

Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device	Industry Part Number	Recommended National Device
SMBT2907	MMBT2907	SMP60N06	NDP606A	TMBD914	MMBD914
SMBT2907A	MMBT2907A	SMP60N06-14	NDP706A	TMBF4091	MMBF4391
SMBT3904	MMBT3904	SMP60N06-18	NDP706B	TMBF4092	MMBF4392
SMBT3906	MMBT3906	SMU15N05	NDU406A	TMBF4093	MMBF4393
SMBTA13	MMBTA13	SO2222	MMBT2222	TMBF4391	MMBF4391
SMBTA14	MMBTA14	SO2222A	MMBT2222A	TMPF4392	MMBF4392
SMBTA42	MMBTA42	SO2369	MMBT2369	TMPF4393	MMBF4393
SMBTA43	MMBTA42	SO2907	MMBT2907	TMPFB246A	BSR58
SMBTA92	MMBTA92	SO2907A	MMBT2907A	TMPFB246B	BSR58
SMBTA93	MMBTA92	SO3904	MMBT3904	TMPFB246C	BSR58
SMD15N05	NDD406A	SO3905	MMBT3906	TMPFJ111	MMBFJ111
SMD25N05-45L	NDD506A	SO3906	MMBT3906	TMPFJ112	MMBFJ112
SMD3010001	BAS16	SO5401	MMBT5401	TMPFJ113	MMBFJ113
SMD3010002	BAV70	SO5550	MMBT5550	TMPFJ174	MMBFJ174
SMD3010003	BAV99	SST111	MMBFJ111	TMPFJ175	MMBFJ175
SMD3010004	BAW56	SST112	MMBFJ112	TMPFJ176	MMBFJ176
SMD3020001	BZX84C5V1	SST113	MMBFJ113	TMPFJ177	MMBFJ177
SMD3020002	BZX84C5V6	SST174	MMBFJ174	TMPT2221	MMBT2222
SMD3020003	BZX84C6V2	SST175	MMBFJ175	TMPT2221A	MMBT2222A
SMD3020004	BZX84C6V8	SST176	MMBFJ176	TMPT2222	MMBT2222
SMD3020005	BZX84C7V5	SST177	MMBFJ177	TMPT2222A	MMBT2222A
SMD3020006	BZX84C12	SST308	MMBFJ309	TMPT2906	MMBT2907
SMD4010001	MMBT2222A	SST309	MMBFJ309	TMPT2906A	MMBT2907A
SMD4010002	MMBT2907	SST310	MMBFJ310	TMPT2907	MMBT2907
SMD4010003	MMBT2907A	SST4391	MMBF4391	TMPT2907A	MMBT2907A
SMD4010004	BSR17A	SST4392	MMBF4392	TMPT3903	MMBT3904
SMD4010005	MMBT3906	SST4393	MMBF4393	TMPT3904	MMBT3904
SMD4010007	BC847	SST4416	MMBF4416	TMPT3905	MMBT3906
SMD4010008	BCX71	TIS74	TIS74	TMPT3906	MMBT3906
SMP25N05	NDP505B	TIS75	TIS75	TMPT4401	MMBT4401
SMP25N05-45L	NDP505BL	TIS93	TIS93	TMPT4402	MMBT4403
SMP25N06	NDP505B	TIS97	TIS97	TMPT4403	MMBT4403
SMP30N10	NDP610A	TIS98	TIS98	TMPT5086	MMBT5086
SMP40N10	NDP710A	TMBD2835	MMBD1205	TMPT5087	MMBT5087
SMP50N05	NDP605B	TMBD2836	MMBD1205	TMPT5088	MMBT5088
SMP50N06	NDP606B	TMBD2837	MMBD1204	TMPT5089	MMBT5089
SMP50N06-25	NDP606A	TMBD2838	MMBD1204	TMPT5401	MMBT5401
SMP60N05	NDP605A	TMBD6100	MMBD4148	TMPT5550	MMBT5550



# Cross-Reference of Devices (continued)

Industry Part Number	Recommended National Device
TMPT5551	MMBT5551
TMPTA05	MMBTA05
TMPTA06	MMBTA06
TMPTA13	MMBTA13
TMPTA14	MMBTA14
TMPTA20	MMBT3904
TMPTA42	MMBTA42
TMPTA43	MMBTA42
TMPTA55	MMBTA55
TMPTA56	MMBTA56
TMPTA70	MMBT5086
TMPTA92	MMBTA92
TMPTA93	MMBTA92
TMPZ5230	MMBZ5230B
TMPZ5231	MMBZ5231B
TMPZ5232	MMBZ5232B
TMPZ5233	MMBZ5233B
TMPZ5234	MMBZ5234B
TMPZ5235	MMBZ5235B
TMPZ5236	MMBZ5236B
TMPZ5237	MMBZ5237B
TMPZ5238	MMBZ5238B

Industry Part Number	Recommended National Device
TMPZ5239	MMBZ5239B
TMPZ5240	MMBZ5240B
TMPZ5241	MMBZ5241B
TMPZ5242	MMBZ5242B
TMPZ5243	MMBZ5243B
TMPZ5244	MMBZ5244B
TMPZ5245	MMBZ5245B
TMPZ5246	MMBZ5246B
TMPZ5247	MMBZ5247B
TMPZ5248	MMBZ5248B
TMPZ5249	MMBZ5249B
TMPZ5250	MMBZ5250B
TMPZ5251	MMBZ5251B
TMPZ5252	MMBZ5252B
TMPZ5253	MMBZ5253B
TMPZ5254	MMBZ5254B
TMPZ5255	MMBZ5255B
TMPZ5256	MMBZ5256B
TMPZ5257	MMBZ5257B
TN2219	TN2219
TN2219A	TN2219A
TN2905	TN2905

Industry Part Number	Recommended National Device
TN2905A	TN2905A
TN3019	TN3019
TN3725	TN3725
TN4033	TN4033
TN4036	TN4036
U1897	U1897
U1898	U1898
U1899	U1899
U257	U257
U309	U309
U310	U310
U401	U401
U403	U403
U406	U406
VN0610LL	2N7000
VN10KE	BS170
VN10KM	BS170
VN222L	BS170
VN610L	BS170
ZVN3302A	BS170
ZVN3304A	BS170
ZVN3306A	BS170